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OF

NORTH AMERICAN REPTILES

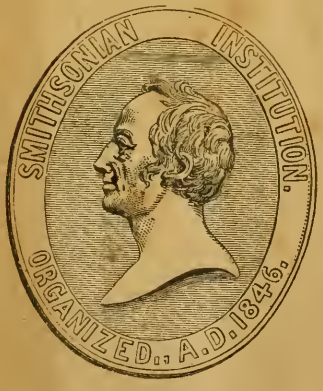
IN THE MUSEUM OF THE

SMITHSONIAN INSTITUTION.

PART I.—SERPENTS.

BY

S. F. BAIRD AND C. GIRARD.



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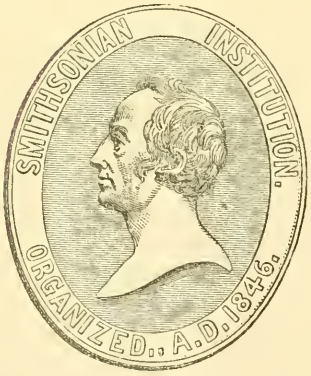

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Secretary S. I.

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PREFACE.

In the present catalogue it is proposed to present a systematic account of the collection of North American Serpents in the museum of the Smithsonian Institution. In the Appendix will be found such species not in possession of the Institution, as could be borrowed for description, as well as notes on more or less authentic species of which no specimens could be found.

A complete synonomy of all the species has not been attempted, as tending to swell the bulk of a catalogue too much. All those, however, necessary to a proper understanding of the history or character of the species, have been introduced, and all the synonyms quoted have been actually verified by original reference.

Owing to the want of osteological preparations, it has been a difficult task to arrange the genera in a natural succession. In many cases forms are now combined which will hereafter necessarily be widely separated. The almost entire deficiency of modern general works upon the *Colubridæ*, has also been a serious obstacle to any correct idea of a natural system. The forthcoming work of M. M. Duméril will undoubtedly clear up much of the obscurity which now exists. But when systematic writers all carefully avoid the subject of the Ophidians, each waiting for the others to make the first step, the attempt to combine genera by well marked, though perhaps artificial points of relation, will it is hoped be looked upon with indulgence, even after more comprehensive and extended investigations shall render it necessary to break up the combinations here adopted.

The collections upon which the original descriptions of the present catalogue have been based are as follows:—

Spencer F. Baird. Species from Massachusetts, New York, Ohio, and Pennsylvania.

Charles Girard. Maine, Massachusetts, and South Carolina.

Rev. Charles Fox. Species from Eastern Michigan.

Dr. P. R. Hoy. Species from Eastern Wisconsin.

Prof. L. Agassiz. Lake Superior, Lake Huron, and Florida.

Dr. J. P. Kirtland. Northern Ohio.

G. W. Fahnestock. Western Pennsylvania.

Miss Valeria Blaney. Eastern Shore of Maryland.

Dr. C. B. R. Kennerly. Northern Virginia.

John H. Clark. Maryland, Texas, New Mexico, and Sonora.

John Varden. District of Columbia and Louisiana.

Dr. J. B. Barratt. Western South Carolina.

Miss Charlotte Paine and Mrs. M. E. Daniel. Western S. Carolina.

Dr. S. B. Barker. Charleston, S. C.

Prof. F. S. Holmes and Dr. W. J. Burnett. South Carolina.

R. R. Cuyler and Dr. W. L. Jones. Georgia.

D. C. Lloyd. Eastern Mississippi.

Dr. B. F. Shumard and Col. B. L. C. Wailes. Mississippi.

James Fairie. Mexico and Western Louisiana.

Capts. R. B. Marcy and G. B. McClellan, U. S. A. Red River, Ark.

Ferdinand Lindheimer. Central Texas.

Col. J. D. Graham, U. S. A. The specimens collected while on the U. S. and Mex. Boundary Survey, by Mr. J. H. Clark, viz., in Texas, New Mexico, and Sonora.

Maj. W. H. Emory. Specimens collected on the U. S. and Mexican Boundary Survey, by Arthur Schott, at Eagle Pass, Tex., and by J. H. Clark, in Texas and New Mexico.

Gen. S. Churchill, U. S. A. Valley of the Rio Grande.

Dr. L. Edwards, U. S. A. Northern Mexico.

Dr. Wm. Gambel. New Mexico and California.

Dr. John L. Le Conte. Littoral California.

Dr. C. C. Boyle and J. S. Bowman. Central California.

Dr. A. J. Skilton. Species collected in California by Henry Moores, Esq.

U. S. Exploring Expedition. Littoral California and Oregon.

Academy of Natural Sciences of Philad. Various unique specimens described by Dr. Holbrook.

Boston Society of Natural History. California.

SPENCER F. BAIRD,
Assist. Sec. S. I. in charge of Museum.

Smithsonian Institution,
January 5, 1853.

INTRODUCTION.

EXPLANATION OF TERMS USED.

The *vertical* plate is the central one in the middle of the head above, having on each side of it the *superciliaries*, which form the upper part of the orbit. The two plates behind the vertical are the *occipitals;* the pair in front of it, the *postfrontals.* The *prefrontals* or *anterior frontals* are situated in front of the postfrontals; and anterior to these and terminating the snout is the *rostral.* The plates immediately in front of the eye are the *anteorbitals;* those behind it are the *postorbitals.* In advance of the anteorbital is the *loral,* between which and the rostral are the two *nasals,* with the nostril between them. The *upper* and *lower labials* margin the upper and lower jaws. The *temporal* shields are situated between the upper labials and the occipitals. The *inframaxillary* or *mental* scutellæ or shields are just within the lower labials.

The arrangement on the top of the head of one rostral, two pairs of frontals, one vertical with one superciliary on each side, and one pair of occipitals we have considered as typical or normal, from which but few of the genera described vary. Sometimes one plate occupies the place of the two prefrontals, and in some genera a second median plate is seen between the rostral, frontals, and vertical. On the side of the head we have sometimes but one nasal, and sometimes either the loral or the anteorbitals may be wanting. Where the latter condition exists, it is sometimes difficult at first to determine which plate has disappeared. A clue is to be found in the shape of the remaining plate; if this be longitudinal, it is probably the loral; if vertical, or divided into two or more, one above the other, it is to be considered as anteorbital. The loral belongs to the postfrontals, and the anteorbital to the vertical, the posterior edges in the former and

the anterior in the latter generally ranging. Thus, when the vertical plate is very short, the anteorbital is also short or wanting entirely, and the same relation holds good between the loral and postfrontals.

The specimen whose measurements are first given, unless stated to the contrary, has served as the type of the description, and the first mentioned species is to be considered as the type of the genus.

Of the five numbers given at the end of the descriptions, the first indicates the number of the abdominal scutellæ from chin to anus. The second is that of the pairs of subcaudal scutellæ; the third, the dorsal rows or the number of rows of scales around the body (excluding the abdominal series). The fourth number shows the entire length of the animal, and the fifth the length of the tail, in English inches.

In referring to the dorsal rows, the exterior one, or that next the scutellæ, is considered to be the first, unless the contrary is stated.

When there are two numbers separated by the symbol at the beginning of the measurements, the first indicates the number of entire abdominal scutellæ, the latter of those that are bifid or divided. The subcaudal scutellæ are to be considered as divided or in pairs, unless mentioned to the contrary.

In enumerating the number of labial plates, those on one side of the jaws only are to be understood, and the terminal and median one on the symphysis of the upper and lower maxillaries is never included. On the upper jaw that plate is at the end of the snout, and is the rostral.

The descriptions are all based on specimens preserved in alcohol, unless otherwise stated.

Synopsis of Families and Genera, and list of Species of North American Serpents.

Family I.—**Crotalidae**. Erectible poison fangs, in front. Few teeth in upper jaw. A deep pit between the eye and nostril.

Family II.—**Colubridae**. Both jaws fully provided with teeth. No anal appendages.

A. *Loral and anteorbital both present.*

B. *Either loral or anteorbital absent.*

Family III.—**Boidae**. Both jaws with teeth. Rudiments of hinder limbs or spur-like anal appendages.

Family IV.—**Typhlopidae**. Teeth only in one jaw, either the upper or lower. Upper jaw strongly projecting. Scales on the belly instead of scutellæ, disposed in several series like those on the upper surface.

Family I.—CROTALIDÆ.

		Page
Tail with a rattle. Top of head covered	with small scale-like plates.....**Crotalus**	1
	with large plates arranged as in *Coluber* .....**Crotalophorus**.....	11
Tail without a rattle. Loral plate	present.....**Agkistrodon**.....	17
	absent.....**Toxicophis**.....	19

Family II.—**COLUBRIDÆ.**

A. *Loral and anteorbital both present.*

Dorsal Scales

						Page
smooth. A permanently erect poison fang on each side					**Elaps**	21
carinated. Plates on vertex	typical. Postorbitals	three. Postabdominal scutella	entire		**Eutainia**	24
			divided		**Nerodia**	38
		two. Loral	excluded from orbit		**Regina**	45
			entering in orbit		**Ninia**	49
	not typical. Labials	excluded from the orbit			**Heterodon**	51
		entering into the orbit			**Pituophis**	64
	typical. Median dorsal rows only carinated				**Scotophis**	73
smooth, except *Leptophis*. Postabd. scut.	entire. Dorsal scales	not imbricated. Superciliaries narrow			**Ophibolus**	82
		imbricated. Superciliaries broad			**Georgia**	92
	divided. Vertical plate	long, narrow. Rostral	normal.	Postorbitals on the 4th labial	**Bascanion**	93
				" on the 5th labial	**Masticophis**	98
			with lateral edges above the level of nasals		**Salvadora**	104
		short, broad. Snout obtuse.	One nasal. Scales	carinated	**Leptophis**	106
				smooth.	**Chlorosoma**	108
			Postorbitals	one	**Contia**	110
			Two nasals. Anteorbitals	two	**Diadophis**	112
			one. Postorbitals	two	**Lodia**	116
				three	**Sonora**	117
		broad. Snout pointed. Subcaudal scutellæ		divided	**Rhinostoma**	118
				entire	**Rhinocheilus**	120

Family II.—COLUBRIDÆ, *continued.*

B. *Loral or anteorbitals absent.*

					Page
Anteorbitals absent. Prefrontals	one.	Scales	carinated	**Haldea**	122
			smooth	**Farancia**	123
	two.	Scales smooth. Post-orbitals	two.	One nasal — **Abastor**	125
				Two nasals — **Virginia**	127
			one.	**Celuta**	129
Loral absent. Scales	smooth		Postabdom. sc. divided	**Tantilla**	131
			" " entire	**Osceola**	133
	carinated			**Storeria**	135

Family III.—BOIDÆ.

				Page
Anteorbitals & superciliaries	one.	Loral one	**Wenona**	139
	three.	Lorals two	**Charina**	154

Family IV.—TYPHLOPIDÆ.

			Page
Cephalic plates consisting of	Frontonasals, nasals, oculars, parietals, and postparietals	**Rena**	142
	Prefrontals, frontal proper, fronto-nasals, nasals, oculars, pre- and supra-oculars, and parietals	**Ophthalmidion**	155

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(*The new species are indicated by an asterisk*).

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4.	" lucifer, B. & G.	Oregon	6
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SUMMARY.

Genera.	Old	13
	New	22
	Total	35
Species.	Old	65
	New	54
	Total	119

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SERPENTS.

Genus **CROTALUS,*** Linn.

Gen. Char. Upper surface of head covered with small plates, scale-like, with a few larger ones in front. The tail is terminated by a well-developed rattle. A deep pit between the eyes and the nostrils. Subcaudal scutellæ entire. Temporal and labial shields small and convex.

1. Crotalus durissus, Linn.—Head angular. Scales between the superciliaries small, numerous, uniform. Plates above snout, 2 anterior frontal, and 5 postfrontal. Suborbital chain continuous, of large scales. Two rows between this and labials. Labials 12–14 above, 5th largest; 13–15 below. Scales on the back 23–25, all carinated; carination on outer row obsolete. Tail black. Above sulphur-brown, with two rows of confluent brown lozenges. Light line from superciliary to angle of the mouth. Behind this a dark patch.

Syn. *Crotalus durissus*, Linn. Syst. Nat. I. 1766, 372.—Gm. *Linn.* Syst. Nat. ed. xiii. I., III. 1788, 1081.—Holbr. N. Amer. Herp. III. 1842, 9. Pl. i. —Dekay, New Y. Fauna. Pt. III. 1842, 55. Pl. ix., fig. 19.—Storer, Rep. Rept. of Mass. 1839, 233.

Vipera caudisona americana, Catesb. Nat. Hist. Carol. II. 1743, 41. Pl. lxi. Banded Rattlesnake.

Head above covered with small subtuberculous scales. Superciliaries large. Anterior frontals large, triangular, emarginated behind to receive a series of three small plates. A single subhexagonal plate between the superciliary and anterior frontal. The exterior plate of the posterior frontal row is much the largest, and is in contact with

* The names and characteristics of the higher divisions will be given in the synopsis of species.

The figures at the end of the descriptions refer, the 1st to the number of abdominal scutellæ; 2d, to the subcaudal scutellæ; 3d, to the dorsal rows; 4th, to the total length; and 5th, to the length of the tail.

the superciliaries. A series of three or four larger flat scales extends from the posterior extremity of the superciliary. Scales on the cheeks very large, truncate. Anterior orbitals double; the upper one rectangular, elongated longitudinally; separated from the nasal by two small plates.

General color above, that of roll sulphur; beneath, whitish yellow. Along the back is a double series of subrhomboidal blotches, looking as if they had been in contact, and then the line of junction partially effaced for the three or four central rows. The impression conveyed of the color of these blotches is that of coarse mottlings of soot or gunpowder grains, more crowded exteriorly. There are twenty-one of these blotches from the head to the anus, the tail being entirely black. The rhomboids are enclosed within about twelve dorsal series of scales. Directly opposite to these spots on each side is a series of subtriangular blotches similarly constituted as to colour, and extending from the abdomen to about the fifth lateral row, and some six or seven scales long. Anteriorly these are distinct from the dorsal series, but posteriorly they are confluent with them, forming a series of zigzag blotches across the body. The scutellæ below show more or less of the grain-like mottlings. Posteriorly the yellow of the body is suffused with darker.

There are no markings of lines distinctly visible on the sides of the head. In the centre of the spaces between the dorsal and lateral series of blotches are indications of small obsolete spots; and in some cases the yellow scales external to the blotches are of lighter colour than the rest.

Huntingdon Co., Pa. 166. 25. 23. 42. 5. D. C. Lloyd.

Another specimen has the ground-color darker, more brownish yellow. The markings, however, are on the same pattern, except that the line of junction of the blotches is not so much effaced, and the colors more decided. Lateral row of scales smooth, not cariated. Plates of head similar. Fifteen labial plates, fourth upper one the largest. The blotches are nearly uniform umber-brown, margined with darker; the scales external to which are lighter than the ground-color.

Lycoming Co., Pa. 165. 25. 23. 25. 3½. S. F. Baird.

A female from Huntingdon Co., Pa., has the general pattern of the one last mentioned, but a dark brown tint pervades the whole

body, and obscures the pattern of coloration. External row of scales smooth. The inferior orbital chain is composed of scales nearly as large as the two next rows.

Huntingdon Co., Pa. ♀ 168. 18. 23. 35. 3½. S. F. Baird.

In a specimen from Prairie Mer Rouge, La., the general system of coloration is similar; it differs principally in having a reddish brown strip or tint down the back, for a width of some three scales, extending from head to tail. First row of lateral scales smooth. Plates of head as described, except that there are but two plates embraced between the two postfrontals. The upper jaw pale cream colour, the line of demarcation starting from the anterior canthus, and passing backward to the angle of the mouth, along the edge of the labials, or rather a narrow cream-colored line beginning on the upper labials, at the angle of the mouth, and widening on the fifth plate, encloses the whole anterior portion of the face below the nostrils. The white patch closely mottled with black beneath the eye. A brown patch across and beneath the angle of the mouth, interrupted by the white just mentioned.

Prairie Mer Rouge, La. 165. 27. 25. — — Jas. Fairie.
Mississippi. Col. Wailes.

2. Crotalus adamanteus, Beauv.—Head triangular. Two anterior frontals, connected with superciliaries on each side by two large plates: inside of these a second row; included space filled by small scales. Scales margining superciliaries small; scattered larger ones toward the centre of the intermediate space. Three rows of scales between the suborbitals and labials. Suborbitals extending to the middle of the orbit. Labials 15 or 16 above; 1st, 5th, and 7th largest and vertical;—below, 18; 1st, 4th, and 5th largest. Dorsal rows 27; outer rows obsoletely carinated. Three or four dark rings on tail. Three series of well-defined perfect rhombs, one dorsal, two lateral, separated by narrow lines. Light stripe from superciliary to the angle of the mouth. A second in front of the eye.

Syn. *Crotalus adamanteus,* Beauv. Trans. Amer. Philos. Soc. IV, 1824, 368.—Holbr. N. Amer. Herp. III, 1842, 17. Pl. ii.

C. horridus, Harl. Journ. Acad. Nat. Sc. Philad. V, ii, 1827, 370.

Diamond Rattlesnake.

Scales on the cheek smooth. Three rather large plates on the edge of the upper part of the head, between the superciliaries and rostral, inside of which is a second row of three, also larger than the rest.

The two lower rows of lateral scales smooth. Third and fourth very faintly carinated. Scales on the back and sides not conspicuously different in size except the lower 2 or 3 rows. Posteriorly, near the tail, all the scales are carinated except the lowest.

General color, yellowish gray, with rhomboidal black blotches, lighter in the centre, and with all the angles perfect. Or rather there is a series of dull yellowish lines crossing obliquely from one side of the abdomen to the other over the back, following the oblique series of scales, and occupying generally the posterior half of each scale, the basal portion being black. These lines, of which there are about 36 crossing from each side, from head to tail, (9 on tail,) decussate first on the 5th or 6th lateral row, and then on the back, where they are more or less confluent three or four rows. The rhomboids thus enclosed and crossing the back are generally black for 1½ or 2 scales within the yellowish lines, and the most central portion is dark yellowish brown, mottled with darker. The intervals on the sides between the lines are mostly dark yellowish brown, minutely mottled with dark brown. These intervals constitute a lateral series of transverse rhomboids, sometimes with the lower angle truncated. Opposite to the dorsal rhomboids is a series of small triangles in the angles of the first decussation. The distance between two parallel transverse stripes generally consists of five rows of scales, occasionally of six.

On the sides and posteriorly these markings are more or less indistinct, though generally recognisable. The tail usually exhibits a good deal of black. The under parts are dull yellowish white, or greenish white, clouded toward the sides with brown. No regular spots visible. The black on the tail does not constitute complete rings, but is interrupted in the middle of the lower surface, and in fact the black patches alternate with each other, and are not opposite.

The top of the head is light brown, with occasional black scales. A dull yellowish streak starts at the posterior edge of the superciliary plate, and passing obliquely backward, through two rows of scales, extends to the angle of the mouth. A second band starts on the plate in advance of the superciliary, and crossing the anterior orbitals, expands till it involves the 7th, 8th, and 9th upper labials. Interval between the first two stripes dark brown. There are also indications of a second vertical light bar in front of the nostril, and two below the pit. Rostral dark yellowish, lighter in the margin.

Charleston, S. C. 169. 32. 27. 48. 5¼. Dr. Barker.

3. Crotalus atrox, B. & G.—Head subtriangular. Plates on head; 2 anterior frontals in contact, between these and superciliaries, on side of the crown, 2 imbricated plates. Space enclosed occupied by smaller scales. Superciliaries bordered by a row of larger scales; the anterior much largest. Three rows of scales between labials and suborbitals. Labials 16 above; 1st, 5th, and 7th largest;—15 below, 1st and 3d largest. Dorsal rows 25–27: 2 exterior rows smooth. On the tail 3–6 half rings. Color yellowish brown, with a continuous succession of dorsal lozenges, sometimes truncate before and behind; intervals all narrow. A single transverse light line on superciliary. Stripe from superciliary directly to the angle of the mouth.

General style of coloration somewhat as in *C. adamanteus*. Ground-color above dull yellowish brown, with a series of subhexagonal patches from the head nearly to the tail, in an uninterrupted series, separated throughout by narrow lines. We may refer the markings to the intersection of two series of light yellowish lines, about 40 in number, crossing obliquely from each side across to the other, along the anterior half of as many oblique series of scales. The lateral decussation is along the sixth row of dorsal scales; on the back, where they cross, the lines are confluent for a breadth of five or six scales, making a series of transverse lines across the back, truncating the obtuse angles of the rhomboids, which would otherwise be produced. Sometimes the acute lateral angle of the rhomboids are also truncated. Laterally, the yellowish lines are more or less obsolete, leaving a more or less distinct chain pattern. The rhomboids or subrhomboids enclosed have a narrow margin of dark brown, lighter toward the centre. In all cases the interval between the successive rhomboids is but one or two half scales in width. The lateral rhomboids and triangles referred to in *C. adamanteus* are indicated by two alternating series of dark brown blotches, the first along the 3d and 4th lateral row, opposite the apices of the rhomboids; the second along the 6th and 7th, and alternating with the same; the spots occupy one scale, or part of four contiguous ones. Space between these rhomboids and the yellowish lines, dull yellowish brown. Beneath nearly uniform yellowish, slightly clouded on the sides of the scales. On the tail the blotches are confluent into 3 or 6 dark brown half rings, interrupted on the under surface. General distribution of lines on the head much as in *C. adamanteus;* a narrow light line from the posterior end of the superciliary backward, directly to the

angle of the mouth; a second from the anterior extremity, nearly parallel with the first, the two enclosing an indistinct patch, and separated on the labials by $4\frac{1}{2}$ scales. There is also a single narrow light line across the superciliary perpendicular to its length, obsolete in old specimens.

It may readily be distinguished from *C. adamanteus* by its light color and the truncations of the rhomboids, as well as the general obsoleteness of the lateral markings. The rhomboids are longer in proportion and more rounded. The two lateral rows of scales are smooth, the next two more strongly carinated than in *C. adamanteus*. The 5th upper labial is largest, and transverse; the rest nearly uniform. The stripes on the side of the head are less distinct.

From *C. confluentus*, it may be distinguished by the greater comparative size of the interval between the dorsal blotches, especially posteriorly. In *C. confluentus*, there are two light lines across the superciliary plate, dividing it into three sections, the central rather narrower. Here, too, the posterior facial stripe, instead of passing to the angle of the mouth, goes back of it on the 2d row above the labials, in *C. atrox*, passing directly to the angle of the mouth. Other important distinctions are seen in the narrower scales of *C. confluentus*, &c.

From *C. lucifer*, the more narrow head, fewer and larger intersuperciliary scales, lighter color, arrangement of color along the head, will at once distinguish it.

Indianola.	187. 23. 25. 33. $3\frac{1}{8}$.	Col. J. D. Graham.
"	183. 27. 27. $39\frac{1}{2}$. $4\frac{7}{8}$.	"
"	177. 28. 25. 36. $4\frac{5}{8}$.	"
"	187. 23. 25. $15\frac{3}{4}$. $1\frac{1}{2}$.	"
San Pedro, Texas.	177. 28. 25. 36. $4\frac{5}{8}$.	"

4. Crotalus lucifer, B. & G. Muzzle broad. Scales between the superciliaries numerous, small, and uniform. Plates on top of head, 4 prefrontal, 4 postfrontal, or else irregular. Three rows scales between the subcrbitals and labials. Labials 16 above; 1st and 5th largest;—15 below. Dorsal rows 25, exterior smooth, 2d and 3d with obsolete carination. Tail, and posterior portion of body with 16 or 17 half rings. A succession of brown dorsal hexagons or octagons, separated throughout by a narrow lighter line. Light stripe from superciliary crosses the angle of the mouth on the 3d and 4th row above labial.

Syn. *Crotalus lucifer*, B. & G. Proc. Acad. Nat. Sc. Phila. VI., 1852, 177.

Head very broad anteriorly, outline little tapering. Head above covered with many small tuberculiform scales, showing a substelliform radiation. Interval between superciliary plates filled with small scales, nearly uniform in size; row bordering the superciliaries very small. Scales in front of the superciliaries variable: in one specimen there are two rows of four each, of considerable size; in another they are larger than the rest, but irregular. Scales on the cheeks large, flat, smooth.

Ground-color, light brown above. Along the back a series of subhexagonal or octagonal blotches, formed by a skeleton of dull yellowish, constituting a dorsal chain. The space thus enclosed of the ground-color is margined faintly with dark brown: the width of the interval between the successive blotches is from one-half to one and a half scales. These spots are frequently confluent, two and three running together. Where most distinct the spots are four scales long and eleven wide. On each side of this dorsal series is a second, separated by a single row of scales, the blotches extending from the abdominal scutellæ to the 5th or 6th row. These are smaller than the dorsal, and subcircular. Opposite the transverse light bands, and in the open space between four contiguous blotches on the sides, smaller blotches are indistinctly visible. Posteriorly, the spots on the back and sides are confluent and darker; in one specimen forming 17 half rings, encircling the back, leaving about 24 dorsal blotches. Abdomen greenish yellow, more or less clouded with brown at the bases of the scales. Head dark brown; a light line from posterior portion of the superciliaries along the 4th row of supralabial scales back to the angle of the jaws, on the occiput, where it expands into the color of the under part. Upper labials of the same light color behind, rapidly widening anteriorly so as to include whole front and side of the face, leaving only the top of the head dark. The space about the facial pit darker.

The theory of coloration is that of decussating lines, which, when they intersect, unite so as to have the angles of intersection truncated.

The species has a general resemblance to *C. atrox* in the arrangement of the blotches, but is darker, and has about 17 dark half rings posteriorly instead of 4 or 5. In *C. atrox* the head is narrower and more triangular, the space between the superciliaries narrow, and occupied by angulated larger scales instead of small tuberculous ones. In *C. atrox*, the row bordering the superciliaries is much larger than the rest, and the scales on the top of the head generally more angu-

lated. In *C. lucifer*, the line on the side of the head, instead of going directly from the posterior end of the superciliary to the commissures, passes back nearly parallel to the mouth, crossing along the 4th row of scales above the labial. The second line in front of the eye is much wider below in *C. lucifer*, and the face generally shows more of white, while the dark portions are much darker.

A specimen collected in California by Dr. Leconte resembles this, but owing to the imperfect state of preservation, little definite can be ascertained. The dorsal figures are, however, more in lozenges than in hexagons. Color dark. Size, very large.

Oregon. 168. 25. 25. 27¾. 3¾. (in dep.) Expl. Exped.

5. Crotalus confluentus, Say. Head subtriangular. Plates on top of head squamiform, irregular, angulated, and imbricated; scales between superciliaries small, numerous, uniform. Four rows of scales between the suborbital series (which only extends to the centre of the orbit) and the labials. Labials 15 or 18, nearly uniform. Dorsal series 27–29. Dorsal blotches quadrate, concave before and behind; intervals greater behind. Spots transversely quadrate posteriorly, ultimately becoming 10 or 12 half rings. Two transverse lines on superciliaries, enclosing about one-third. Stripe from superciliary to angle of jaws, crosses angle of the mouth on the second row above labial. Rostral margined with lighter.

Syn. *Crotalus confluentus*, Say, in *Long's* Exped. Rocky Mts. II, 1823, 48.
C. Lecontei, Hallow. Proc. Acad. Nat. Sc. Philad. VI, 1851, 180.

This species bears a considerable resemblance to *C. atrox*, but the body is more slender and compact. Scales on the top of the head anterior to the superciliaries nearly uniform in size. Line of scales across from one nostril to the other consists of six, not four as in *C. atrox*. Superciliaries more prominent. Labial series much smaller. Upper anterior orbitals much smaller, as also is the anterior nasal. Scales on the top of the head less carinated. Scales between superciliaries smaller and more numerous, five or six in number instead of four. Two lateral rows of scales smooth, first, second, and third gradually increasing in size. Scales more linear than in *C. atrox*.

General color yellowish brown with a series of subquadrate dark blotches, with the corners rounded and the anterior and posterior sides frequently concave, the exterior convex. These blotches are ten or eleven scales wide and four or five long, lighter in the centre, and margined for one-third of a scale with light yellowish. The intervals along the back light brown, darker than the margins of the

blotches. Anteriorly the interval between the dark spots is but a single scale; posteriorly it is more, becoming sometimes two scales, where also the spots are more rhomboidal or lozenge-shaped; nearer the tail, however, they become transversely quadrate. The fundamental theory of coloration might be likened to that of *Crotalus adamanteus*, viz. of forty or fifty light lines decussating each other from opposite sides; but the angles of decussation, instead of being acute, are obtuse, and truncated or rounded off throughout. Along the third, fourth, and fifth lateral rows of scales is a series of indistinct brown blotches covering a space of about four scales and falling opposite to the dorsal blotches: between these blotches, and opposite to the intervals of the dorsal blotches, are others less distinct. Along the fifth, sixth, seventh, and eighth rows is a second series of obsolete blotches, each covering a space of about four scales, and just opposite the intervals between the dorsal spots. The dorsal and lower series are separated by an interval of three scales, this interval light brown. Beneath, the color is dull yellowish, and ten or twelve darker half rings are visible on the tail.

In point of coloration the principal features, as compared with *C. atrox*, lie in the dorsal blotches, being disposed in subquadrate spots instead of subrhomboids; the intervals thus forming bands across the back perpendicular to the longitudinal axis. This tendency to assume the subquadrangular pattern has broken up the chain-work into isolated portions, as in *Coluber eximius* or *Crotalophorus tergeminus*. The intervals of the dorsal blotches are wide and darker in the middle, while in *C. atrox* they are narrow, not linear, and unicolor. The sides of the head present the usual light stripe from the posterior extremity of the supereiliary; it passes, however, to the angle of the jaw on the neck, along the second row of scales above the labials. A second stripe passes in front of the eye to the labials, widening there. A small light vertical bar is seen below the pit, and another on the outer edge of the rostral. On the supereiliaries are seen two light transverse lines enclosing a space nearly one-third of the whole surface. In *C. atrox* there is a single median line. Sometimes, as in *C. atrox*, the single blotches on the nape are replaced by two elongated ones parallel to each other.

Red River.	180. 27. 29.	34. 4.	Capt. Marcy.
San Pedro, Texas.	181. 28. 27.	— —	Col. J. D. Graham.
Bet. San Antonio and El Paso.	188. 23. 27.	27. 3.	" "

6. Crotalus molossus, B. & G. Muzzle broad; rostral small. Scales between superciliaries small, uniform, except the two anterior. Two frontal plates, four postfrontal. Two inter superciliary, all in contact. Five rows scales between the labials and suborbital row. Middle row, not extending beyond the middle of the orbit. Labials 18 above, fifth and sixth largest; 17 below. Dorsal rows of scales 29. Two external rows small. Tail uniform black. Color roll sulphur, a series of chestnut-brown transverse lozenges, with exterior corners produced to the abdomen. Centres of lozenges with one or two spots. Each scale but one color. A brown patch below and behind the eye.

One of the most strongly marked of all the species. Head very broad in front; outline nearly rectangular. Rostral small. Two anterior frontals; behind these four plates, the exterior resting on the superciliary; behind these two other plates, between and in contact with the superciliaries. Anterior nasal subtriangular. Top of head with numerous smooth subtuberculous scales. Suborbitals large, extending to the anterior canthus. General aspect smoother than in Crotali generally, scales rounded at the posterior apex, carinated but slightly.

General color above that of roll sulphur, beneath pale yellowish, posteriorly very faintly clouded with brownish. Tail black. Anteriorly the scutellæ are entirely immaculate. Along the back is a series of transverse reddish or chestnut-brown lozenges embraced in a width of 12 or 14 scales and 4 or 5 scales long, and with the exterior angles produced to the abdomen. These lozenges are frames with the outline generally one scale in width and with the centres of the ground-color; sometimes divided by a median line of brown, so as to show two yellowish spots inside of the lozenges. The scales exterior to the lozenges are rather lighter. Sometimes the brown rings and the lozenges widen at the abdomen and indicate lateral spots of four scales; at others, and especially anteriorly, the rings are obsolete, and the brown is in a dorsal series. In fact, for the anterior fourth of the body we have a dorsal patch of brown, showing alternately at successive intervals one large yellowish spot and then a pair of smaller ones, owing to the confluence of the successive lozenges. The superciliaries and scales anterior to them, as well as a broad patch below and behind the eye, light greenish brown. Tail uniform dark brown above, paler beneath. Only one button with two necks, no rattle.

A remarkable character of this species is that each individual

scale is of the same uniform tint to its base, and not showing two colours as in other species.

Fort Webster, St. Rita del Cobre, N. Mex. 187. 25. 29. 33⅞. 3. Col. J. D. Graham.

Genus **CROTALOPHORUS**, Gray.

Gen. Char. Upper surface of the head covered with nine large plates, as seen in *Coluber* and allied genera. The tail terminates in a rattle, generally smaller than in *Crotalus*. A deep pit between the eye and nostril, as in *Crotalus*. Subcaudal scutellæ entire, except a few at the end of the tail, which are bifid.

Syn. *Crotalophorus*, Gray, Ann. Philos. 1825, 205.

1. Crotalophorus miliarius, Holbr.—Twenty-two or twenty-three dorsal rows of scales, all of which are carinated, the lateral and first row but slightly; a vertebral brownish red line; seven series of blotches, one dorsal and three lateral, on each side, the uppermost of which is obsolete and the lowest subject to irregularities. Vertical plate subcordiform, occipital oblong and elongated. A narrow white line commences at the lowest point of the orbit and passes obliquely backward to the angle of the mouth.

Syn. *Crotalus miliarius*, Linn. Syst. Nat. I, 372.—Gm. *L.* Syst. Nat. ed. XIII, I, iii, 1788. 1080.—Merr. Vers. Syst. Amph. 1820, 156.—Harl. Jonr. Acad. Nat. Sc. Phila. V, ii, 1827, 370. Holbr. N. Amer. Herp. II, 1838, 73 Pl. xv.

Caudisona miliarius, Wagl. Syst. Amph. 1830, 176.

Crotalophorus miliarius, Holbr. N. Amer. Herp. 2d. ed. III, 1842, 25. Pl. iv.

Vipera Caudisona americana minor. Catesb. Nat. Hist. Carol. II, 1743, 42. Pl. xiii.

Ground Rattlesnake.

Ground-color dark greyish ash, minutely mottled. A series of thirty-eight to forty-five subcircular dorsal blotches extending from head to tail, dark brown, each with a narrow distinct yellowish border. Interval rather narrower than the spots themselves. A broad band of purplish red passes from head to tail, through the blotches. On each side may be distinguished three series of blotches, the first on the first and second lateral rows of scales and partly on the abdominal scutellæ. The second alternating with this on the second, third, fourth, and fifth rows of scales, and opposite the dorsal

series. The third alternating with the second and the dorsal series, on the fifth, sixth, seventh, and eighth rows of scales. The latter series is dusky and obsolete; the others are uniform and distinctly black.

The shape of the blotches is subjected to some variation according to individuals. Generally subcircular or slightly oblong, they become sometimes a transversely elongated quadrangle, three times as long as wide. Their shape varies according to the region of the body on which they are found. On the anterior third they are subquadrangular, anteriorly and posteriorly emarginated; on the middle region they elongate, and toward the posterior third become nearly circular. Backward of the anus the five or six blotches of that region extend on the sides, without, however, meeting on the lower surface. The blotches of the first lateral row are subquadrangular and a little smaller than those of the second and third rows; the blotches of the second row being transversely oblong and largest on the middle region of the body. Side of the head purplish brown. A narrow distinct white line from the lowest part of the orbit passing obliquely backward to the angle of the mouth. Above and continuous with that white line a deep chestnut-brown vitta is observed, of the same length but broader and lined above with a narrow dull yellowish margin. Two undulated dark-brown vittæ extend from the vertex to the first dorsal blotch and confluent with it. A double crescentic blotch is observed on the frontal scutellæ leaving a transversal fulvous band across the head between the orbits. The color underneath is reddish yellow, marmorated with brownish black blotches and minute dots.

The scales are elongated, carinated, and acute posteriorly. Those of the lateral row are slightly carinated also, but narrower than in *C. consors*, and more acute posteriorly.

Liberty Co., Georgia.	135.	28+5.	23.	$15\frac{7}{8}$. $2\frac{1}{8}$.	Dr. Jones.
Charleston, S. C.	136.	22+11.	22.	$17\frac{3}{4}$. $2\frac{3}{8}$.	Dr. Barker.
"	135.	30.	23.	$14\frac{1}{2}$. $1\frac{5}{8}$.	"
"	135.	31+5.	22.	$15\frac{1}{4}$. $1\frac{7}{8}$.	"
"	136.	27.	23.	$13\frac{1}{4}$. $1\frac{3}{8}$.	"
"	132.	34.	22.	14. $1\frac{7}{8}$.	"

2. Crotalophorus consors, B. & G.—Twenty-five rows of dorsal scales, all carinated except the two first rows on either side. Seven series of blotches, one dorsal and three on each side, all very small. A yellowish white line passing from behind the nostril below and behind the eye.

Resembles *C. miliarius* in its general appearance, but without the vertebral brownish red line. The ground color is olivaceous brown, the blotches of a deeper brown, encircled with a black fillet margined with a whitish yellow line. There are about fifty blotches in the dorsal series emarginated anteriorly only, thirty of which are transversely elongated, very irregular; the twenty remaining ones nearly circular, with regular outlines. The blotches of the lateral rows are comparatively small and of nearly equal size, though sometimes one of either row may appear much the largest. The blotches of the first lateral series are opposite to those of the dorsal and affect the 1st, 2d, and 3d rows of scales and the extremities of the abdominal scutellæ. The blotches of the second series alternate with these, extending on the 3d, 4th, and 5th rows of scales. The blotches of the third series are obsolete and alternate with those of the second series, and are generally opposite to those of the dorsal series situated in the 5th, 6th, and 7th rows. The upper surface of the head is brown; there are two vittæ extending from the vertex along the neck to the first dorsal blotch. A broader and deep chestnut-brown band extends from the eye to the neck. The frontal region is deeper brown than the vertex. A yellowish white line starts from the nostrils near the upper surface of the head, extending backward in passing between the eye and the pit to the angle of the mouth. A vertical whitish bar extends from each side of the pit to the labial. The belly is yellowish white marbled with black transversely oblong patches. The vertical plate is cordiform; the anterior frontal plates proportionally small; the occipital rather broad. The scales of the body are elongated, a little smaller than in *C. miliarius*, but not quite so acute posteriorly. The two lateral and smooth rows are much broader than the rest and conspicuous: most of the scales of these two rows are black, with the posterior edge straw colored, giving the appearance of a succession of distinct crescents. The tail is conical and tapering; the rattle composed of one ring besides the terminal one.

Indianola. 147. 33. 25. 18½. 2¼. Col. J. D. Graham.

3. Crotalophorus tergeminus, Holbr.—Twenty-five rows of dorsal scales, strongly carinated, with the exception of the first row, which is perfectly smooth. Vertical plate subhexagonal, pointed posteriorly. Seven longitudinal series of blotches. A narrow band of yellowish white extends from the pit to the neck in passing close to the angle of the mouth.

Syn. *Crotalus tergeminus*, Say, *Long's* Exp. Rocky Mts. I, 1823, 499.—Harl. Journ. Acad. Nat. Sc. Philad. v. iii, 1827, 372.
Crotalophorus tergeminus, Holbr. N. Amer. Herp. III., 1842, 29. Pl. v.
Crotalophorus, ... Agass. Lake Sup. 1850, 381. Pl. vi. fig. 6–8.
Prairie Rattlesnake, Massasauga.

The ground color above is brown; the blotches are deep chestnut-brown blackish externally, and with a yellowish white margin. The dorsal blotches are thirty-four in number from the head to the region opposite the anus, twenty-six of which are transversely and irregularly oblong, anteriorly and posteriorly emarginated—less so, however, posteriorly; eight are subcircular. Five or six exist on the tail from the anus to its tip, extending on the sides, the last two forming sometimes a complete ring. The next series on either side is composed of small blotches, but as intensely colored as in the other series. They alternate with the dorsal ones. They have no regularity either in outline or position. The second lateral row is composed of the largest lateral blotches. They are transversely oblong or oval on the second, third, fourth, fifth, and sixth rows of scales, and opposite the blotches of the dorsal series; consequently alternating with the third series above. The first lateral series again is composed of blotches intermediate in size between those of the third and second series; they occupy the first and second rows of scales, and extend somewhat to the abdominal scutellæ, and alternating with the adjoining series. Two undulated vittæ extend from the supraorbital plates along the neck to the first dorsal blotch, and often confluent with the latter. A linear vitta margined with yellowish white extends from the posterior edge of the eye to the sides of the neck; the inferior yellow margin is the broadest, and passes from the pit close to the angle of the mouth, turning forward to the middle of the lower jaw, enclosing a semi-elliptical brown patch. Two elongated yellowish spots may be observed diverging from both sides of the pit to the lip. The cephalic plates are deep chestnut brown; a transverse light brown band extends across the head from one orbit to the other.

The color underneath is blackish brown intermingled with yellowish.

Racine, Wisc.	150.	21.+1.	25.	29½.	2¾. Dr. Hoy.
Grosse Isle, Mich.	136.	31.	25.	19⅜.	2⅜. Rev. Chas. Fox.
Warren Co., Ohio.	141.	29.	25.	23⅜.	3⅜. Dr. J. P. Kirtland.

4. Crotalophorus Edwardsii, B. & G.—Twenty-three rows of dorsal scales; first and second lateral row smooth. Vertical plate subpentagonal, tapering posteriorly. Lateral rows of blotches proportionally very small.

The ground-color is yellowish brown with three lateral series of deep chestnut-brown blotches. Two elongated brown blotches extend from the supercilliaries backward. A narrow band of chestnut brown, from the posterior frontal plates, passes over the eyes to the neck, under which a yellowish stripe extends from the nostril to the angle of the mouth. The snout and upper jaw are brown with two yellow fillets diverging from the pit. The lower jaw and chin are mottled with brown and yellow. There are about forty-two dorsal brown and irregular blotches margined with deep black and encircled with a yellow fillet, from the head to the tip of the tail—the 34th opposite the anus—the last three passing to the sides of the tail but do not meet below. Subcircular on the posterior half of the body, the blotches on the anterior half are longer transversely than longitudinally; emarginated anteriorly only.

The blotches of the two lateral series are proportionally small. The blotches of the upper series are more or less obsolete and alternate with the dorsal ones. Those of the second lateral series are the smallest and alternate also, being of as deep a color as the dorsal ones, but do not extend beyond the anus, occupying the second, third, and fourth rows of scales. The first and lower series affect the first and second rows, and only one scale. The belly is of a light straw color, dotted and sprinkled irregularly with brown.

Scales elliptical, subtruncated posteriorly, constituting twenty-three rows, strongly carinated, except the two lateral rows, which are smooth.

Head, when seen from above, subelliptical; vertical plate proportionally more elongated than in *C. tergeminus.*

Tamaulipas.	143.	28.+3.	23.	17⅛.	2⅛. Dr. Edwards.
S. Bank of Rio Grande.	153.	24.	23.	11.	1⅖. Gen. Churchill.
Sonora.	145.	26.	23.	8½.	1⅛. Col. J. D. Graham.

5. Crotalophorus Kirtlandii, Holbr.—Twenty-five rows of dorsal scales, sometimes only twenty-four, all strongly carinated except those of the first lateral row. Vertical plate rather short and broad. Color in the adult almost uniformly black, with a vertebral series of dusky brown blotches, sometimes very obsolete. Underneath bluish slate, with the posterior margin of the scutellæ yellowish.

Syn. *Crotalophorus Kirtlandii,* Holbr. N. Amer. Herp. III, 1842, 31, Pl. vi.

Black Massasauga.

The scales of the lateral row are as broad or high as long. Those of the second row are but slightly carinated, and distinguished from the next rows above in being broader and regularly elliptical posteriorly. The carinated scales are elongated, and the narrowest as they approximate the dorsal region. They are posteriorly rounded or subacute.

In the young, eight inches and a half long, the ground-color is brown, with a dorsal series of deep brown spots transversely oblong, emarginated anteriorly and posteriorly, almost quadrangular on the posterior region of the body and tail; and thirty-four in number from head to tail. There are three lateral series of blotches on each side; the upper one composed of small and obsolete blotches, alternating with the dorsal ones; the second row is composed of vertically oblong blotches, larger than those of the upper, and a little smaller than those of the lower series. The latter extend partly on the abdominal scutellæ, as in *C. tergeminus* and other allied species. Six or seven rings to the rattle.

Warren Co., Ohio.	140. 21+5. 24.	23¾.	2½.	Dr. J. P. Kirtland.
"	144. 19+5. 23.	24⅝.	2⅝.	"
"	142. 17+3. 25.	25.	2½.	"
"	143. 15+9. 25.	8½.	⅞.	"

Genus **AGKISTRODON**, Beauv.

Gen. Char. A deep pit between nostril and the eye. Nine plates on top of head. Without rattle. Poison fangs as in *Crotalus*. One pair of occipitals. A loral between the nasal and anterior orbitals. Labials excluded from the orbit by the presence of suborbital plates. Scales carinated; rows 23 in number. Subcaudal scutellæ divided posteriorly. Sometimes a small plate between the vertical and postfrontals. Habits terrestrial.

Syn. *Agkistrodon*, Pal. de Beauv. Trans. Amer. Phil. Soc. Philad. IV, 1799, 381.

1. Agkistrodon contortrix, B. & G.—Loral present. Labials not entering into the orbit. Dorsal rows of scales 23. Color light chestnut, with inverted Y-shaped darker blotches on the sides. Labials yellowish white.

Syn. *Boa contortrix*, Linn. Syst. Nat. I, 273.—Gm. *L.* Syst. Nat. ed. xiii, I, iii, 1788, 1082.

Agkistrodon mokason, Beauv. Trans. Amer. Philos. Soc. Philad. IV, 1799, 380.

Scytalus cupreus, Rafin. Amer. Journ. Sc. I., 85.—Harl. Med. & Phys. Res. 1835, 130.

Trigonocephalus cenchris, Schl. Ess. Phys. Serp. Part. desc., 1837, 553. Pl. xx, fig. 10 and 11.

Trigonocephalus contortrix, Holbr. N. Amer. Herp. II, 1838, 69 Pl. xiv, and 2d ed. III, 1842, 39. Pl. viii.

Copperhead.

More slender than *Toxicophis pisciovorus*. Plates on neck and side smaller. Two anterior orbitals, one above the other, the lower narrower, and forming the posterior wall of the pit. A distinct loral between these and the posterior nasal. Labial not forming part of the orbit, but separated by the four post and suborbitals. Labials not so largely developed; 8 above, 3d and 4th largest; 9 below.

Above light hazel brown, rather brighter on the top of the head, and everywhere minutely mottled with very fine dark points. On each side is a series of 15–26 darker chestnut-colored blotches resting on the abdominal scutellæ, and suddenly contracting about the middle of the side, so as somewhat to resemble an inverted Y. These

blotches extend to the vertebral line, where they may be truncated or end in a rounded apex. Generally those of opposite sides alternate with each other, but frequently they are confluent above, forming continuous bands. They are so disposed, that the intervals between the successive blotches are pretty much of the same shape and size, though inverted. The centres of the blotches are lighter; in some cases so much so as greatly to increase the Y-shaped resemblance. Color beneath dull yellowish, with a series of distinct large dark blotches, 35–45 in number, on each side. Chin and throat unspotted. Sides of head cream color; the line of demarcation very distinct; this passes along the upper edge of the head, in front of the eye, and involving the lower three-fourths of the orbit, intersects the middle of the 2d postorbital plate, (counting from above,) and extends along the 1st row above the labials, to the posterior edge of the last labial; the line then comes back through the middle of the lower labial range, where it is marked by a narrow black line. Rostral of the same color. A small areolated dark spot near the inner edge of each occipital plate.

Cleveland.	153. 40+10.	23.	$27\frac{7}{8}$. $3\frac{5}{8}$.	Dr. Kirtland.
"	152. 42+10.	23.	29. $4\frac{3}{8}$.	"
Foxburg, Pa.	152. 32+18.	23.	$26\frac{7}{8}$. $3\frac{3}{4}$.	S. F. Baird.
"	152. 32+18.	23.	$32\frac{3}{4}$. $4\frac{1}{2}$.	"
"	150. 48.	23.	7. $3\frac{3}{4}$.	"
Carlisle, Pa.	154. 42.	23.	$22\frac{7}{8}$. $2\frac{7}{8}$.	
"	154. 48.	23.	$28\frac{1}{2}$. $4\frac{1}{8}$.	"
Charleston.	150. 40+8.	23.	$24\frac{3}{4}$. $3\frac{3}{8}$.	C. Girard.
Prairie Mer Rouge, La.	153. 40+8.	23.	$20\frac{3}{4}$. $2\frac{7}{8}$.	Jas. Fairie.
" "	150. 30+18.	23.	$20\frac{3}{4}$. 3.	"

Blotches larger and fewer, about 15 in number, and running more upon the abdomen. Vertical plate larger and more acute posteriorly.

Bet. Indianola & San Antonio.	150.	23.		Col. Graham.
Sabinal.	150. 31+17.	23.	$11\frac{1}{8}$. $1\frac{5}{8}$.	"

Genus **TOXICOPHIS**, Troost.

Gen. Char. No rattle. Pit and fangs as in *Agkistrodon*. Eleven plates on top of head. No loral plate between nasal and anterior orbital. A second and smaller pair of occipital plates contiguous to the first. Labial entering into the orbit. Scales very conspicuously carinated, forming 25 longitudinal rows. Subcaudal scutellæ divided posteriorly. Habits aquatic.

Syn. *Toxicophis*, Troost, Ann. Lyc. Nat. Hist. N. York, III, 1833, 190.

1. Toxicophis piscivorus, B. & G.—No loral. Inferior wall of orbit constituted by 3d labial: 25 dorsal rows. Dark chestnut brown, with indistinct vertical dark bars. Line from superciliary along the edge of the head, through the middle of the second supra labial row. A second line from the lowest point of the orbit parallel to the first.

Syn. *Trigonocephalus piscivorus*, Holbr. N. Amer. Herp. II, 1838, 63. Pl. xiii. and 2d ed. III, 1842, 33. Pl. vii.

Water moccasin.

Scales all large and well developed; those on the sides and back of head conspicuously so. Two nasal plates with the nostril between them. Anterior orbitals two, one above the other; the upper extending from the eye to the posterior nasal, the lower linear, and forming the upper wall of the pit. Lower and posterior wall of pit constituted by a narrow plate resting along the 3d labial, and terminating on the 2d. Third labial very large, constituting the inferior wall of the orbit, of which three scales form the posterior. Upper labials 8, very large and broad: lower 10. Occipitals terminated each by a triangular plate. All the scales on the back of the head carinated. Dorsal scales all carinated.

General color dark chestnut-brown, with darker markings. Head above purplish black. An obsolete chestnut-brown streak passes from the posterior end of the superciliary along the upper edge of the head, through the middle of the 2d row of supralabial scales. A narrow yellowish white line passes from the 3d labial, or begins just below the lowest part of the orbit, and passing backward, paral-

lel with the first stripe, crosses the angle of the mouth at the 7th labial, and meets the first stripe on the side of the neck, where it is confluent with the yellowish white of the throat. On the lower labial are three short, nearly vertical light bars, on the 4th, 6th, and 7th; the rest of the jaw itself, as well as the interval between the stripes on the sides of the head, dark purplish brown, of which color is also the space in front and below the eyes. General color above dull dark chestnut-brown. On each side a series of 20 or 30 narrow vertical purplish black bars, one or two scales wide. Of these, sometimes two contiguous to each other on the same side are united above into an arch, enclosing a space, the centre of which is rather duskier than the ground-color; at others, corresponding bars from the opposite sides unite and form half rings, encircling the body. Sometimes there is a lighter shade bordering the dark bars. Beneath black, blotched with yellowish white.

Prairie Mer Rouge. 140. 24 + 21. 25. $22\frac{3}{4}$. $3\frac{1}{2}$. Jas. Fairie.

2. Toxicophis pugnax, B. & G.—No loral plate. Second labial displaced; 25 dorsal rows. Above olive-brown, with narrow transverse dark zigzag bars. Cheeks uniform light colored.

General structure of the plates as in *T. piscivorus.* No loral. Second labial pressed out of place, and with its apex alone on the edge of the mouth. Scales of head smaller than in *T. piscivorus.* Outline different. Lower edge of orbit bordered by parts of two labials.

General color above light olive-brown; beneath yellowish, with a series of indistinct square brown blotches on each side; chin and throat unspotted. Tail entirely black. A series of transverse dark brown zigzag lines are seen crossing the back, involving the entire surface of single scales; these lines are broken up more or less, so as to render the definition of pattern very difficult. Sometimes the band will be indicated merely by a few dark scales on the middle of the back; at others it may be traced to the blotches on the abdomen. Of these blotches there are about 30 from head to anus. The intervals between the bands are much larger than the bands themselves, being from 3 to 6 scales in length. No indication of a dark patch behind the eye, but the cheeks appear yellowish brown, brighter on the labials.

Indianola, Tex. 145. 21 + 21. 25. $36\frac{1}{2}$. $5\frac{3}{4}$. Col. J. D. Graham.

Genus **ELAPS**, Schn.

Gen. Char. Body slender and cylindrical, never exceeding three or four feet in length. Head somewhat depressed, in most cases continuous with the body; subelliptical in shape, tapering forwards, covered above with plates, generally nine in number. No pit between the eyes and the nostrils. Mouth moderately cleft, not dilatable as in the other serpents. Upper jaw furnished on each side with a small permanently erect fang, situated more posterior than in *Crotalidæ*. The tail is continuous with the body, conical, and tapering towards the tip. Scales smooth; subcaudal scutellæ entirely bifid.

Syn. *Elaps*, Schn. Hist. Amph. Nat. & Lit. 1801, 289.

1. Elaps fulvius, Cuv.—Head oval, posteriorly broader than the neck. Body red, annulated with black rings margined with yellow. Vertical plate pentagonal, rounded anteriorly; its posterior tapering part included between the occipitals.

Syn. *Coluber fulvius*, Linn. Syst. Nat. I, 1766, 381.—Gm. *Linn.* Syst. Nat. ed. xiii, I, iii, 1788, 1104.

Vipera fulvia, Harl. Journ. Acad. Nat. Sc. Philad. V, 1827, 364.

Elaps fulvius, Cuv. Règn. Anim. II, 1817.—Fitz. N. Class. Rept. 1826, 61.—Holbr. N. Amer. Herp. II, 1838, 87. Pl. xviii; and 2d ed. III, 1842, 49. Pl. x.

Harlequin Snake.

The red may be considered as the ground-color of the body, though the black rings occupy nearly as much space above as the red, so as to give the general appearance of a succession of red and black rings. The yellow is intermediate. The anterior part of the head from the posterior point of the vertical plate, embracing the orbits, is black, as is also the tip of the lower jaw. A yellow ring passes across the occipital region down to the inferior surface of the head, embracing the space between the posterior rim of the eye and the angle of the mouth. Then comes a black ring, covering eight dorsal scales, margined posteriorly with yellow. From this region to the origin of the tail, the black and red rings from 14 to 19 in number each, alternate, being

separated from each other by a narrow band of yellow. The black rings cover seven entire scales, and two halves; the intermediate red space, five entire scales and two halves; and the yellow either one and two half-scales or two halves only. Some red spaces may occasionally cover nine and ten scales. The tail is alternatively black and yellow; the first caudal ring is black, and embraces ten scales; the second is yellow, and covers three scales. Two black and two yellow succeed and cover the same ground. The tip of the tail is black on five scales. The tip may be either black or yellow, for, according to the size, there are either three or four black rings. Underneath the colors are the same, but dull; occasionally one or more black rings may not surround the body. The reddish spaces are irregularly blotched with deep black, as also sometimes on the upper surface.

Charleston, S. C.	207. 30. 15.	28½. 3½.	C. Girard.
"	205. 39. 15.	22⅝. 2¾.	Dr. S. B. Barker.
"	209. 37. 15.	17¼. 1⅞.	"

2. Elaps tenere, B. & G.—Head narrow, elongated, continuous with the neck and body. Body fawn-colored, annulated with black and yellow. Vertical and occipital plates narrow and elongated.

The ground-color is of a light fawn, dotted with black, annulated with black rings about one-third narrower than the fawn, and with yellow rings about the half of the width of the black ones. The anterior portion of the head is black, from the posterior rim of the eye across the middle of the vertical plate to the mouth, scarcely affecting the tip of the lower jaw. A yellow ring embraces the occipital region from the eyes to the angles of the mouth. There are thirteen black rings from the head to the origin of the tail, and twice as many yellow ones, the fawn-colored rings being equal in number to the black ones. The first black ring covers eight scales. The succeeding ones cover only six, and occasionally the half of the next scale. The yellow rings embrace two entire scales and two halves. The fawn-color intermediate covers nine or ten scales, the last but one only seven or eight, and the last five or six. On the tail the fawn is absent, and two black and two yellow rings alternating cover the whole space. The first of the caudal rings is black, and embraces ten and two half-scales; the yellow coming next, covers four scales; the second black one twelve and two half-scales; the second yellow also

four scales; the extreme tip of tail is black. Underneath, the coloration is the same, with less brilliancy; the fawn-colored rings are maculated with black blotches.

The proportional difference in width between the colored rings constitutes a great difference between this species and *E. fulvius*. It is a much more slender snake, provided with a more slender head, which imparts to the cephalic plates a more elongated shape, especially to the vertical and occipitals. The eyes also are much smaller.

San Pedro of Rio Grande.	237+2. 26. 15.	17⅜.	1⅝.	Col. J. D. Graham.
New Braunfels, Tex.	230+1. 29. 15.	26.	2.	F. Lindheimer.
"	224+1. 38. 15.	22.	2½.	"

3. Elaps tristis, B. & G.—Head broad behind, pointed forwards. Vertical plate subpentagonal, equilateral, with its posterior triangular part short and obtuse. Eyes proportionally small.

The affinities of this species are intermediate between *E. fulvius* and *E. tener*. It has the red-colored ground, annulated with black rings, fourteen in number, and covering five or six scales above, occasionally seven, and only three or four when reaching the outer or lateral rows: thus these rings diminish towards the abdomen. The yellow rings on the other hand have the same width as in *E. fulvius*, embracing one entire row of scales and two halves. The intermediate red spaces affect six or seven scales, dotted all over with deep black, as in the two preceding species. The tail has four black and three yellow rings, the tip being yellow. The first three black ones embrace nine and eight scales, the fourth only six. The intermediate yellow cover three or four scales.

The shape and structure of the head, as given above, are the prominent distinguishing characters.

Kemper Co., Miss.	203. 41. 15.	17⅝.	2⅛.	D. C. Lloyd.
Rio Grande, W. of San Antonio.	209. 40. 15.	10½.	1¼.	Gen. Churchill.

Genus **EUTAINIA**, Baird & Girar.

Gen. Char. Body moderately stout in some species, slenderer in others. Scales carinated. Skin very extensible. Cephalic plates normal. Anterior orbitals 1; posterior 3. Abdominal scutellæ all entire; subcaudal divided. Dorsal rows of scales 19–21. Abdominal scutellæ, 140–170. Subcaudal, 50–120. General color, three light stripes on a darker ground, intervals with alternating or tesselated spots. Abdomen without square blotches. Mostly terrestrial. Many of the species ovo-viviparous.

A. *Body very slender, elongated. Tail very long. Lateral stripe on the third and fourth rows of scales. Dorsal rows* 19.

1. Eutainia saurita, B. & G.—Very slender. Color above light chocolate. Three stripes of uniform yellow. Below the lateral stripes, light brown. Abdomen greenish white. On an average the length of tail is more than one-third the total length.

Syn. *Coluber saurita*, Linn. Syst. Nat. I, 1766, 385.—Gm. *Linn.* Syst. Nat. ed. xiii, I, iii, 1788, 1109.—Harl. Journ. Acad. Nat. Sc. Philad. V, 1827, 352.—Storer, Rep. Rept. Mass. 1839, 229.—Thomps. Hist. of Verm. 1842, 115.

Leptophis sauritus, Holbr. N. Amer. Herp. III, 1842, 21. Pl. iv.—Dekay, New York Fauna, 1842, 47. Pl. xi, fig. 24.

Riband Snake; Swift Garter Snake.

A broad vertebral line of sulphur-yellow, occupying one and two half-rows of scales, the line margined for half a scale on each side with black. A lateral stripe on each side along the 3d and 4th rows of lateral scales; the scales in the exterior edges of this stripe occasionally speckled or margined with black. Skin between the scales black, with numerous small yellow lines, half a scale long, seen only in dilating the skin. In some specimens the black shows as a series of lateral spots. The usual double spot on the line of union of the occipitals. Orbital plates yellowish white, as are the lower part and sides of the head and throat.

In one specimen from Westport, N. Y., there is a well-defined black line under the lateral stripe.

Carlisle.	156.	115.	19.	35.	$12\frac{1}{4}$.	S. F. Baird.
"	157.	118.	19.	$26\frac{3}{4}$.	9.	"
Washington.	157.	118.	19.	$32\frac{1}{2}$.	9.	"
Westport, N. Y.	—	—	—	—	—	"
Lancaster, Mass.	—	—	—	—	—	"
Virginia.	—	—	—	—	—	C. Sanford.

2. Eutainia Faireyi, B. & G.—Body above blackish brown, with three longitudinal stripes of uniform tint. Abdomen greenish white. Stouter than *E. saurita.* Head large. Tail rather less than one-third total length.

Syn. *Tropidonotus saurita?* Schleg. Ess. Physiogn. Serp. Part. discr. 1837, 321.

A dorsal stripe one and two half-scales wide, and one lateral on each side on the 3d and 4th row, of the same color, (greenish yellow.) Scales broader and more rounded than in *E. saurita;* head stouter, color different. Differs from *E. proxima,* in having all the longitudinal stripes of the same color; from *E. saurita* in a stouter body, and in having the color below the lateral stripe the same as that above. Body slender, but stouter than in *E. saurita.* The tail is proportionally shorter than in *E. saurita,* but longer than in *E. proxima.*

Prairie Mer Rouge, La.	178.	115.	19.	$30\frac{1}{2}$.	10.	Jas. Fairie.
" "	174.	114.	19.	$26\frac{1}{4}$.	8.	"
" "	168.	—	19.	29.	—	"

3. Eutainia proxima, B. & G.—Body stoutest of the division. Black above; three longitudinal stripes, the dorsal ochraceous yellow or brown, lateral greenish white or yellow. Total length about three and a half times that of the tail.

Syn. *Coluber proximus,* Say in *Long's* Exped. to Rock. Mts. I, 1823, 187. —Harl. Journ. Acad. Nat. Sc. Philad. V, 1827, 353.

Deep brown almost black above and on the sides; beneath greenish white. Dorsal stripe on one and two half-rows of scales, ochraceous yellow, lateral stripe on the 3d and 4th rows of scales, greenish yellow or white, markedly different in tint from the dorsal. Sides

of abdominal scutellæ, and 1st and 2d dorsal series of the same color as the back. On stretching the skin, numerous short white lines are visible. Occipital plates with two small approximated spots on the line of junction. Orbitals whitish. The greenish white of the abdomen becomes more yellow anteriorly.

In some specimens from along the Rio Grande the dorsal stripe is ochraceous brown.

Head more like that of *E. saurita* than of *E. Faireyi*, while the body is stouter than in either. The subcaudal scales are less numerous than in the other two allied species. Resembling *E. Faireyi* in color, it is always distinguishable by the stouter body, fewer caudal scales, and dissimilarity of color in the longitudinal stripes.

Red River.	170.	100.	19.	33.	9.	Capts. Marcy & McClellan.
New Braunfels, Texas.	171.	100.	19.	25½.	7¼.	F. Lindheimer.
Near Indianola.	170.	105.	19.	15⅜.	4⅝.	Col. Graham.
" "	178.	108.	19.	19.	5¾.	"
San Pedro, Texas.	169.	105.	19.	14.	4.	"
Sabinal, New Mex.	—	—	—	—	—	"
Medina, New Mex.	—	—	—	—	—	"

B. *Body stouter. Tail shorter. Lateral stripe on the 2d and 3d row of scales.*

1. Dorsal rows 19.

4. Eutainia infernalis, B. & G.—Most slender of all the species of the section. Head and eye large. Above black: a series of about 110 triangular reddish yellow spots, confluent with the indistinct lateral stripe, itself confluent with the greenish white sides and abdomen.

Syn. *Coluber infernalis*, Blainv. Nouv. Ann. Mus. d'Hist. Nat. III, 1834, 59. Pl. xxvi, fig. 3 & 3a.

Aspect colubrine, as indicated by Blainville. A vertebral line of yellowish white, composed of one and two half-rows of scales, on each side of which is a blackish stripe, not encroaching upon the light colored stripe along the 2d and 3d lateral rows of scales. Above the latter the black is interrupted by about 110 subtriangular spots of reddish yellow or reddish white. Abdomen and exterior row of dorsal scales are greenish white, tinged posteriorly with slate. A minute black spot, more or less covered by the incumbent scutellæ

on each side of each abdominal scale, near the extremity. No occipital spot.

The exterior row of dorsal scales is carinated, and larger than the rest, which are about equal. The scales of the slender tail are likewise carinated.

A specimen collected on Sacramento River by the Exploring Expedition is smaller, but very similar. As usual in small specimens, the black is in the form of isolated spots, confluent above, with an olivaceous brown ground.

California.	163.	83.	19.	25½. 6½. Dr. Wm. Gambel.
Sacramento River.	170.	—	19.	13¾. 3½. (on dep.) Expl. Exped.

5. Eutainia Pickeringii, B. & G.—Body slender. Black above, slate-color beneath. Lateral stripe irregular, confluent with the light-colored intervals between the dark spots.

This species exhibits great variations in color, principally in regard to the amount of black on the abdomen and the extent of the stripes. The most strongly marked specimen is of an intense black, tinged with bluish below. There is a very narrow greenish white vertebral line, beginning at the nape, where it occupies one and two half-scales, and gradually narrows to the carina of the middle dorsal row, becoming obsolete at the anus. The carinæ of the 2d and 3d rows of exterior dorsal scales show the faint line of greenish white, only perceptible on close observation. The lores, labials, cheeks, and head beneath, greenish white, gradually shading into the blue-black of the abdomen at or about the anterior fifth.

Puget Sound, Or.	158.	73.	19.	26¼. 6½. (on dep.) Expl. Exped.

In another specimen, with the general color very dark, the vertebral line occupies one and two half-scales throughout. The black on each side appears formed by the confluence above of about 76 spots from head to anus, each spot from 1½ to 2 scales long. In other words, there is a stripe of black 3½ scales wide on each side of the vertebral line, confluent with which is a series of black spots on each side, as indicated. The lateral stripe is on the 2d lateral row of scales, of a greenish white color, and confluent with the intervals of the spots also of the same color. The stripe is not well defined, but swells and narrows like a knotted cord. Exterior row of dorsal

scales and sides of abdomen deep blue-black, becoming greenish toward the middle of the abdomen; anteriorly the color shows more white.

Puget Sound, Or. 170. 86. 19. 18. 4½. (on dep.) Expl. Exped.

In other specimens the lateral lines are better defined, though always more irregular than usual. Sometimes the color above is more brown than described; inferiorly, however, there is always a slate-blue tint, especially behind.

Puget Sound, Or. 166. 87. 19. 21½. 5½. (on dep.) Expl. Exped.
" " 161. 75. 19. 26. 5¾. " "

In this species the inequality between the exterior dorsal row of scales and the rest is inconspicuous. The former is rather the larger, and little or not at all carinated. The second row is about the same size as the rest. The eyes are larger, and the head shorter than in *E. leptocephala*, from the same locality.

Collected by the United States Exploring Expedition, and dedicated to the discoverer, Dr. Charles Pickering.

6. Eutainia parietalis, B. & G.—Above olive-brown: beneath slate-color. Longitudinal stripes greenish. Spaces about and between the dark spots on the sides, brick red, these colors belonging to the skin, not to the scales.

Syn. *Coluber parietalis*, Say, in *Long's* Exped. to Rock. Mts. I, 1823, 186. —Harl. Journ. Acad. Nat. Sc. Philad. V, 1827, 349.

Body apparently more slender than *E. sirtalis*. In many respects resembling *E. Pickeringii*. The only specimen being a stretched skin preserved in alcohol, the colors are somewhat difficult of definition. Above dark olive, beneath light slate-color, except the inferior surface of the head, which is yellowish white. A broad longitudinal dorsal line of one and two half-rows of scales, and an equally distinct one on each side on the second and third dorsal rows, of a greenish slate. The sides of the abdomen and the exterior dorsal row are dark slate-brown. When the skin is stretched, there are seen on each side, between the dorsal and lateral rows, two rows of quadrate black blotches, the first quite distinct, between the third and sixth rows; the second between the sixth and vertebral line, the spots

more or less confluent above with each other, and with those on the opposite side; the blotches about one scale apart. The intervals between the blotches of a vivid brick-red, which color, as well as the black, is sometimes seen on the bases of the adjoining scales. None of the short white lines of *E. sirtalis* are visible. More or less of white on the inferior surface of the tail.

The color when living, as described by Say, is black-brown above, beneath bluish green, head beneath white. A vertebral greenish yellow line, and a lateral pale yellow one: about eighty concealed red spots or semifasciæ on the skin and lateral margin of the scales.

Betw. San Antonio & El Paso. 157. 78. 19. 36. 8½. Col. Graham.

7. Eutainia leptocephala, B. & G.—Scales on the greater portion of tail scarcely carinated. The two exterior dorsal rows on each side unequal, but conspicuously larger than the rest; outer one not carinated. Head slender, plane above. Orbitals 3 posterior; 2 anterior. Above light olive-brown, with distinct small brown spots, 130 in a series from head to anus.

Exterior row of dorsal scales broader than usual, not carinated; second smaller, but also broader than usual, and faintly carinated. Top of head nearly plane from occiput to anterior frontals. Head narrow and depressed. Eyes small. Labials narrow. Scales on sides of anus not conspicuously smaller.

Color dull light olive-brown or light chocolate, beneath pale greenish slate: when the epidermis is removed, the subjacent skin of the abdomen is seen minutely punctured and clouded with black, so as to impart this latter color to the whole, except near the edge. A vertebral dull yellowish line on a single row of scales which appears more prominent than the rest. On each side of this vertebral line are two series of subquadrate black spots, about 130 from head to anus, on about every other scale, or even closer, and showing very conspicuously on the clear ground-color. Bases of all the scales on the sides of the body are more or less black, occasionally showing beyond the incumbent edges. Little or no indication of a lateral stripe. The lower series of black spots is continued in a faint line along the side of the head to the orbit. In one specimen the coloration is less defined, showing a greenish white color above, with tessellated small spots of black.

Puget Sound, Or.	146.	59.	19.	16.	$3\frac{5}{16}$.	(on dep.) Expl. Exped.
" "	149.	66.	19.	$23\frac{1}{2}$.	5.	" "
" "	144.	63.	17.	$17\frac{1}{2}$.	$4\frac{3}{8}$.	" "
" "	148.	—	19.	20.	4.	" "

S. Eutainia sirtalis, B. & G.—Body among the stoutest of their form. Olivaceous brown above the lateral stripes, sometimes nearly black, beneath them greenish white; dorsal stripe narrow, encroached upon by the spot; lateral stripes not conspicuous; two or three rows of small indistinct spots, often not perceptible, especially the lower: about 70 from head to anus.

Syn. *Coluber sirtalis,* Linn. Syst. Nat. I, 1766, 383.—Gm. *Linn.* Syst. Nat. ed. xiii, I, iii, 1788, 1107.—Harl. Journ. Acad. Nat. Sc. Philad. V, 1827, 352.—Storer Rep. Rept. Mass. 1839, 221.

Tropidonotus bipunctatus, Schl. Ess. Physiogn. Serp. Part. descr. 1837, 320.

Tropidonotus sirtalis, Holbr. N. Amer. Herp. III, 1842, 41. Pl. xi.

Tropidonotus tænia, Dekay, New Y. Fauna, Rept. 1842, 43. Pl. xiii, fig. 27.

Striped Snake. Garter Snake.

Color above the lateral stripes dark olive, in old specimens dark brown, beneath greenish white. A narrow, rather indistinct vertebral greenish yellow line. Three series of small indistinct spots on each side, of about 70 from head to anus. The first series is along the exterior dorsal row, the spots about two scales apart. This is sometimes entirely wanting. The second series is on the 3d, 4th, and 5th rows from the abdomen; the third upon the 8th and 9th. In many cases the last-mentioned rows have the spots on opposite sides more or less confluent, giving the appearance of a single median series. These rows of spots are sometimes of a dark chestnut-brown, at others nearly black, and often so blended with the olivaceous of the back as to be scarcely discernible. Numerous short white lines visible on stretching the skin.

Although the 1st, 2d, and 3d exterior dorsal rows of scales are colored like the abdomen, yet a lighter shade on the 2d and 3d gives indication of a lateral stripe.

The bases of the abdominal scales on each side near the outer extremities have a black blotch. There is also the usual double spot on the occiput, not areolated. The dark spotting on the sides belongs more or less to the skin between the scales, in some cases merely tinging the edges of the latter.

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St. Lawrence Co., N. Y.	157.	—	19.	15.	3¼	Dr. Hough.
Westport, N. Y.	151.	80.	19.	21.	5¼.	S. F. Baird.
Adirondack Mts., N. Y.	146.	—	19.	24½.	—	"
"	151.	—	19.	20½.	—	"
"	148.	—	19.	14½.	—	"
Summerville, N. Y.	—	—	—	—	—	"
Madrid, N. Y.	—	—	—	—	—	"
Grosse Ile, Mich.	—	—	—	—	—	Rev. Chas. Fox.
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"	—	—	—	—	—	" "
Androscoggin, Me.	155.	66.	19.	21½.	4⅞.	C. Girard.
Portland, Me.	—	—	—	—	—	Prof. Caldwell.
Clarke Co., Va.	151.	—	19.	26.	—	Dr. Kennerly.
"	160.	56.	19.	18½.	3¾.	"
"	145.	—	19.	10¾.	2½.	"
Centreville, Md.	151.	75.	19.	10⅛.	2½.	S. F. Baird.
Foxburg, Pa.	150.	70.	19.	24.	5¾.	"
"	147.	—	19.	18.	4.	"
Carlisle, Pa.	—	—	—	—	—	"
Abbeville, S. C.	155.	—	19.	11½.	3.	Dr. Barratt.
Anderson, S. C.	—	—	—	—	—	Miss Paine.
Kemper Co., Miss.	139.	60.	19.	29¼.	6.	D. C. Lloyd.
"	138.	—	19.	11½.	—	"
Washington, D. C.	—	—	—	—	—	Col. P. Force.

A very old specimen from Westport, N. Y., (♀) has the dorsal line more conspicuous, but still encroached upon by the black spots, (on the exterior half-row.) Bases of all the scales in the exterior row black. Lateral stripe and exterior row bright yellow, and very conspicuous, brighter than the dorsal stripe. Ground-color dark brown.

Westport, N. Y.	♀	145.	64.	19.	34.	7. S. F. Baird.

9. Eutainia dorsalis, B. & G.—Dimensions of *E. sirtalis.* Outer rows of dorsal scales emarginate. Color olivaceous. Dorsal stripe broad, yellow, margined with black. A row of spots above the lateral stripe.

A broad dorsal stripe of greenish white very well defined, and covering one and two half-rows of scales, margined on each side for one scale continuously with black. On each side, on the 2d and 3d exterior rows, likewise a broad stripe of the same color. Space be-

tween the stripes bright olivaceous, in which on each side is indistinctly seen a series of rather large spots, about 74 in number from head to anus, and ranged just above the lateral stripe. Abdomen, and below the lateral stripes greenish white, not materially differing from the stripes in color, only rather darker. Sides of abdominal scutellæ, and the upper basal edge of the scales in the exterior dorsal row margined with black. A series of black dots on each side of the abdominal scutellæ at the base. The scales in the exterior dorsal row acutely emarginated, as are some of those in the 2d row.

A specimen collected between Monclova, Mexico, and the Rio Grande, by General Churchill.

Rio Grande, Texas. 166. 81. 19. 25½. 6¼. Gen. S. Churchill.

10. Eutainia ordinata, B. & G.—Olive, with three distinct rows of square dark spots on each side: about 85 from head to anus. Lateral stripe wanting; dorsal, very indistinct.

Syn. *Coluber ordinatus*, Linn. Syst. Nat. I, 1766, 379.—Gm. *Linn.* Syst. Nat. ed. xiii, I, iii, 1788, 1097.—Harl. Journ. Acad. Nat. Sc. Philad. V, 1827, 349.

Tropidonotus ordinatus, Holbr. N. Amer. Herp. III, 1842, 45. Pl. xii.

Vipera gracilis maculatus, Catesb. Nat. Hist. Carol. II, 1743, 51. LI.

Vipera viridis maculatus, Catesb. Nat. Hist. Carol. II, 1743, 53. LIII.

Garter Snake, or Grass Snake.

General color greenish brown or olive. Vertebral yellowish line more or less inconspicuous. Lateral stripe on the 2d and 3d rows of scales very little evident. In fact it might be almost said to be wanting, but for a faint trace. Three series of small square dark blotches on each side, about 85 in number from head to anus. The first is on the outer row of dorsal scales, involving the edges of the contiguous scales. The second on the 4th row; the third on each side of the dorsal stripe, both like the first, involving the edges of, and intervals between the contiguous scales; indeed, on stretching apart the skin, the black spots are seen to be converted into a network of black along the skin. Beneath greenish white, with spots of black near each end of the abdominal scutellæ. Upper labial plates all prominently edged vertically with black.

This species strongly resembles *E. sirtalis*, especially the spotted varieties. It may, however, be readily distinguished by the three regular series of tessellated black spots on each side, their promi-

nence, and their number, about 85, not 70. The lateral stripe is nearly absent, and the dorsal quite indistinct. The lower row of blotches is below and along the place of the lateral stripes. The occipital black patch is much larger than in *E. sirtalis*, and the labials more margined.

From *E. Marciana*, which it resembles, the want of the light patch behind the mouth, and the different number of dorsal rows will always distinguish it.

Riceboro, Ga.	139. 68. 19.	28. 7.	Dr. Jones.
"	141. 55. 19.	21. 5¼.	"
Georgia.	152. 79. 19.	14. 3½.	Prof. C. B. Adams.

11. Eutainia ordinoides, B. & G.—A dorsal and two lateral stripes. On each side two series of black spots, about 80 in number; between the lower series reddish brown; between the upper olivaceous. Dorsal rows 19–21. Body stouter than most species. Exterior row of dorsal scales the larger, carinated. Remaining scales nearly equal. Caudal scales strongly carinated.

Syn. *Tropidonotus ordinoides*, B. & G.—Proc. Acad. Nat. Sc. Philad. VI, 1852, 176.

A very strongly defined dorsal stripe of a yellowish color, occupying one and two half-scales. A second line less distinct along the 2d and 3d rows from the abdomen. On each side, between the dorsal and lateral stripes, are two series of subquadrate black spots, 80 to 84 in number, arranged alternately, and occupying portions of several scales; the spots in the lower series larger. Intervals between the lower series of spots occupied by reddish brown scales, in shape and color somewhat resembling the dead leaves of the hemlock, (*Abies canadensis*). Intervals between the upper series olivaceous brown, more or less blended with the black. Beneath uniform greenish white, with bases of the scales black, as they are also on the more exterior dorsal rows; this color, however, rarely shows beyond the margin of the incumbent scales.

In one specimen, which is much larger than the others, the dorsal spots form a rather narrow margin to the broad dorsal stripe, and are more or less confluent with the ground-color. Space between the lower row of spots pale reddish. Dorsal scales 19. Ninety spots from head to anus.

The characters are very strongly marked, and easily recognised.

California.	161. 67. 19.	$35\frac{1}{4}$. $7\frac{1}{2}$. (84 spots)	(on dep.) Expl. Exped.
San Francisco, Cal.	165. 85. 21.	$21\frac{3}{4}$. $8\frac{7}{8}$.	"
"	167. 84. 19.	$28\frac{1}{2}$. $7\frac{1}{4}$. (80 spots.)	Dr. Leconte.

12. Eutainia radix. B. & G.—General color black, with three narrow gamboge-yellow lines. Lateral rows of scales broader than usual.

The head is shorter than usual with the genus. The exterior row of dorsal scales is very broad, nearly as high as long. The second nearly similar in proportion, (a little longer than high,) but smaller, and yet markedly larger than the third and succeeding rows. Posterior angle of the exterior dorsal scales truncated, with the corners rounded off, a character seen to less extent on the second row. The carination of all the scales is greater than usual, and the whole animal has a rougher appearance.

Color above deep brownish black, on the sides verging to lustrous anthracite black, especially on the exterior dorsal and sides of abdominal scutellæ. Beneath bluish black, with minute mottlings of dull gamboge yellowish, which increasing anteriorly becomes uniform greenish gamboge yellow on the anterior third. A narrow line of black near the posterior edge across each abdominal scutella. A dorsal line of gamboge yellow along the middle of the vertebral row of scales, and one on each side along the 3d lateral row, occasionally involving the lower edge of the 4th row.

There are faint indications of the usual black spots where the epidermis has been lost.

Racine, Wisconsin.	153. 51. 19.	$22\frac{3}{4}$. $4\frac{7}{8}$.	Dr. Hoy.

3. Dorsal rows 21.

13. Eutainia elegans. B. & G.—Resembles *E. proxima*, but belongs to a different section. Black above, light beneath. A broad ochraceous dorsal stripe, with two lateral, greenish white. Dorsal scales 21.

Head very short, broad. Upper labial plates highly developed. Eyes small. Exterior dorsal row of scales largest, delicately carinated, remainder of equal size. Above deep blackish brown. An ochraceous or dark gamboge-yellow dorsal stripe begins at the occiput, and suddenly widening to the width of 3 or 4 scales, contracts gradu-

ally to one and two half-rows, at which it continues to the tail. On each side is a well-defined stripe of greenish yellow along the second and part of the third outer row, and contrasting decidedly in color with the vertebral line. The blackish brown color is strongly defined between the stripes, below them the greenish white sides and abdomen are tinged with brown, (on the exterior dorsal and ends of abdominal scutellæ.) The bases of the scales on the exterior dorsal row are black, which sometimes shows when the scales are separated, though usually covered by the incumbent edges.

The species is readily distinguished from its nearest analogue, *E. infernalis*, by the darker color of the sides, the ochraceous dorsal stripe, smaller head, number of dorsal scales, &c. It has a strong resemblance to *E. proxima* in distribution of color, but is stouter and shorter, and has the lateral stripe on the 2d and 3d rows, not on the 3d and 4th.

El Dorado Co., Cal. 167. 57. 21. $23\frac{1}{2}$. $4\frac{1}{2}$. Dr. C. C. Boyle.

A second specimen, belonging to the Boston Natural History Society, has precisely the same markings, although with but 19 dorsal rows. As usual in young individuals, it has black spots along the sides upon an olivaceous ground, with which they are confluent. Above the lateral stripe are seen from 80 to 90 black spots from head to anus, as well as a series of small ones below the line.

California. 155. 80. 19. $13\frac{1}{2}$. $3\frac{1}{4}$. Bost. Soc. Nat. Hist.

14. Eutainia vagrans, B. & G.—Above light brown, beneath slate-color. Vertebral light line on a single row of scales. Two series of small black spots, about 100 in number, on each side.

Above light brown; beneath slate-color, (sometimes black,) with the margins of the scutellæ black. A dorsal line occupying a single row of scales, of a dull yellowish color, the tint occasionally running into the marginal row. On each side of this, two series of small black spots occupying generally a single scale, and varying from 95 to 105, from occiput to anus. The upper series is in the 2d row from the vertebral, the lower in the 7th.

Compared with its nearest neighbor, *E. leptocephala*, it differs in having the exterior row of dorsal scales large and carinated, the next

row scarcely if at all larger than the rest. Scales of tail decidedly carinated. Labial plates much developed. It has also 21 rows of dorsal scales, and 106, not 130 spots, in series from head to anus. The head is larger and much arched.

The specimen from Puget Souud, may possibly belong to a closely allied species, though it is much like that from California.

California.	169. 80.	21.	27.	$6\frac{1}{4}$. (98 spots)	Dr. Gambel.
Humboldt River, Cal.	179. 70–80.	21.	12.	3. (100 ")	J. S. Bowman.
South of Rio Grande, N. Mexico.	173. 90.	21.	$15\frac{3}{4}$.	4. (106 ")	Gen. Churchill.
Puget Sound.	161. 53.	21.	$12\frac{3}{8}$.	$2\frac{1}{4}$. (on dep.)	Expl. Exped.

15. Eutainia Marciana. B. & G.—Prominent color light brown; a vertebral paler line and one lateral on each side, more or less indistinct. Three series of square black spots on each side, of about 56–60 in each series, from occiput to anus. Sides of head black, with a crescentic patch of yellowish posterior to the labial plates. Three and sometimes four black vittæ radiating from the eye across the jaws. A double white spot with a black margin on the suture of occipital plates.

The markings about the head are generally very constant and distinct. Viewed laterally, we see first the large dark brown patch at the back part of the head, extending as far back as the posterior extremity of the jawbones. In the anterior part of this patch is seen the crescentic patch (concave before) of yellowish white, with a more or less narrow dark-brown margin anteriorly. The next black band starts from the posterior edge of the superciliaries, and passes obliquely downwards and backwards along the posterior edge of the 6th upper labial. Similar black margins are seen on the posterior edges of the 5th and 4th labials, the intervening spaces being yellowish white, particularly on the 5th upper labial. Occasionally the posterior margins of the 7th and 3d labials have the black line as well as those mentioned, which frequently extend across to the posterior margins of the corresponding lower labials. The white spot on the anterior portion of the occipital suture is always margined with black.

The six series of black spots are arranged so as to alternate with each other. The lower or third series on each side is below the indis-

tinct lateral stripe. The posterior edges of each abdominal scutella shows a black margined spot on each side. The dorsal line is generally a single scale in width, occasionally including portions of the lateral, and itself sometimes encroached upon by the black spots. Each spot is about a scale or a scale and a half long, and about three scales broad. The number in the dorsal series from the head to the anus varies from 56 to 60. Posterior edges of scales very slightly emarginate, if at all. All are decidedly keeled.

Red River, Ark.	152. 75. 21.	34.	8.	56 spots.	Capts. Marcy & McClellan.
New Braunfels, Tex.	153. 75. 21.	16.	$4\frac{1}{8}$.	60 "	F. Lindheimer.
"	153. 73. 21.	$21\frac{1}{4}$.	$5\frac{1}{4}$.	60 "	"
"	149. 61. 21.	$16\frac{3}{4}$.	$3\frac{1}{2}$.	56 "	"
"	152. 71. 21.	$10\frac{3}{8}$.	$2\frac{3}{8}$.	54 "	"
Near San Antonio.	163. 53. 21.	$20\frac{5}{16}$.	$3\frac{1}{2}$.	58 "	Col. J. D. Graham.
"	160. 85. 21.	$27\frac{3}{8}$.	$6\frac{1}{2}$.	56 "	"
San Pedro.	156. 78. 21.	$12\frac{5}{8}$.	$3\frac{1}{8}$.	56 "	"
"	153. 70. 21.	$14\frac{1}{8}$.	$3\frac{3}{8}$.	56 "	"
Indianola.	145. 66. 21.	$11\frac{3}{4}$.	$2\frac{1}{2}$.	57 "	"

Genus **NERODIA**, Baird & Girard.

Gen. Char. Body generally stout, and almost all the species attaining a large size. Tail one-fourth or one-fifth of the total length. Scales carinated. Cephalic plates normal. Anterior orbitals generally 1, occasionally 2; posterior 3, occasionally 2. Last and sometimes penultimate abdominal scutellæ bifid; subcaudal, all bifid or divided. Dorsal rows of scales 23–29. Abdominal scutellæ 133–154. Subcaudal 66–80. General color, three series of dark blotches on a lighter ground, sometimes almost uniform, brown or blackish. Abdomen unicolor or maculated. Habits aquatic.

1. Nerodia sipedon, B. & G.—Head rather narrow, elongated. One anteorbital; three postorbitals. Vertical plate smaller, and occipitals larger than in *N. fasciata*. Length of vertical equal to commissural line of occipitals. Inframaxillary plates extending near to posterior extremity of seventh lower labials. Dull brown, with narrow transverse light bands margined with black. Dorsal rows 23.

Syn. *Coluber sipedon*, Linn. Syst. Nat. I, 1766, 379.—Gm. *Linn.* Syst. Nat. ed. xiii, I, iii, 1788, 1098.—Harl. Journ. Acad. Nat. Sc. Philad. V, 1827, 351.—Thomps. Hist. of Verm. 1842, 118.

Coluber pœcilogaster, Max. Wied. Reise Inn. Nord. Amer. I, 1839, 106.

Tropidonotus sipedon Holbr. N. Amer. Herp. III, 1842, 29. Pl. vi.

Water Snake.

General color dull brown, exhibiting narrow transverse bands of lighter, margined with dark brown or black; these bands generally about half a scale in width, and their margins more or less parallel immediately on the back. This is especially the case posteriorly, where they are usually at right angles to the axis of the body; anteriorly they are more or less oblique, and widen rapidly towards the abdominal scutellæ. Sometimes the general brown hue is so predominant as to render the transverse marks more or less obsolete, and the general tint then appears uniform above. The abdomen is always dull yellowish, each scutella with large blotches of light brown, margined with black.

In young individuals, and those generally in which the epidermis has been removed, the normal type of coloration is seen to consist of three series of nearly quadrate dark-brown spots, with still darker border, one dorsal, and one on each side. These are so disposed that the two corresponding lateral spots are opposite the interval between the two dorsal, and thus appear to be connected by a light line. The longitudinal diameter of the dorsal spots, amounting to 3 or 4 scales, is the greater, just the reverse of what is the case with the lateral. Of these lateral spots there are generally about 32 on each side from the head to the anus, the spaces between them being equal to or less than the spots, (not greater, as in *N. fasciata*).

While this pattern is generally quite distinguishable on the posterior half of the body, anteriorly it becomes confused, the lateral blotches standing opposite to the dorsal, and becoming confluent, so that the back appears crossed by lozenge-shaped blotches extending to the abdominal scutellæ, and thus separated on the sides by triangular intervals of a lighter color.

Occasionally the color appears to be a dull and rather light brown, with the back crossed by narrow transverse lines, with dark (nearly black, but still not distinct) margins.

Small specimens from Framingham and Westport show a larger amount of black on the sides and abdomen.

Carlisle, Pa.	142+1.	68.	23.	35.	$8\frac{1}{2}$.	S. F. Baird.
"	142+1.	—	23.	—	—	"
"	143+1.	66.	23.	—	—	"
"	136+1.	75.	23.	12.	$3\frac{1}{4}$.	"
"	143+1.	67.	23.	9.	$2\frac{1}{4}$.	"
"	137+1.	75.	23.	$27\frac{1}{2}$.	$7\frac{1}{4}$.	"
"	140+1.	71.	23.	$14\frac{1}{2}$.	$3\frac{1}{2}$.	"
"	141+1.	80.	23.	26.	$7\frac{1}{4}$.	"
Westport, N. Y.	140+1.	70.	23.	16.	4.	"
Centreville, Md.	136+1.	62.	25.	—	—	"
Washington, D. C.	138+1.	62.	23.	35.	8.	"
Framingham, Mass.	—	—	—	—	—	"
Grosse Isle, Mich.	143+1.	—	23.	27.	$5\frac{7}{8}$.	Rev. Chas. Fox.
"	142+1.	59.	23.	24.	$5\frac{1}{8}$.	"

2. Nerodia fasciata, B. & G.—Head broader behind, and deeper than in *N. sipedon;* hence a greater development of labials, temporals, lorals, and nasals. Three and sometimes only two postorbitals. Vertical plate

pentagonal, broad. Transversal lozenge-shaped or oblong black patches on the back, tapering on the sides. About thirty oblong or triangular marks of red on the flanks. Dorsal rows of scales 23, sometimes 25.

Syn. *Coluber fasciatus*, Linn. Syst. Nat. I, 1766, 378.—Holbr. N. Amer. Herp. I, 1838, 93. Pl. xx.

Coluber porcatus, Harl. Journ. Acad. Nat. Sc. Philad. V, 1827, 356.

Tropidonotus fasciatus, Holbr. N. Amer. Herp. 2d ed. III, 1842, 25. Pl. v.

Head elliptical, tapering on the snout. Dorsal rows of scales 23–25, all carinated; carinæ on the dorsal region very conspicuous. Scales on the outer row broad and rounded posteriorly. Tail one-fourth of total length, very much tapering. Vertical plate elongated, pentagonal, posterior triangular portion obtuse. Superciliaries very narrow. Two postorbitals and sometimes three. Superior labials 8 in number; 6th and 7th very large. Inferior labials 9; 4th and 5th largest. Last abdominal scutella divided. A large temporal shield anteriorly contiguous to the postorbitals.

Ground-color above in the adult uniform blackish brown, lighter in the young, which exhibit transverse lozenge-shaped black patches irregularly tapering on the sides. There are from 30 to 38 subtriangular or vertically oblong red spots extending to the abdominal scutellæ. The 26th of these red markings is opposite to the anus, and twelve smaller ones may be observed along the tail, gradually diminishing posteriorly. A black vitta extends from the posterior rim of the eye to behind the angle of the mouth, above and below which a light elongated patch tinged with red may be seen. Underneath reddish white. Labials dusky, margined with reddish brown.

Charleston, S. C.	132+1. 70. 25.	28. 7.	Dr. Barker.
"	130+1. 41. 23.	40. 6½.	Acad. Nat. Sc.
Summerville, S. C.	128+1. 75. 23.	21. 5¼.	C. Girard.

3. Nerodia erythrogaster, B. & G.—Head elongated, narrowing forwards; occipital region flattened; convex on the snout. Vertical plate pentagonal, very large, as are also the occipitals. Three postorbitals. An elevated loral. Dorsal rows of scales 23 in number, all very strongly carinated. Uniform dark bluish black above, lighter on the sides; a lateral or external band of dull blue extending on the abdominal scutellæ. Body beneath uniform dull yellow, tail bluish.

Syn. *Coluber erythrogaster*, Shaw, Gen. Zool. III, 1804, 458.—Holbr. N. Amer. Herp. II, 1838, 91. Pl. xix.

Tropidonotus erythrogaster, Holbr. N. Amer. Herp. 2d ed. III, 1842, 33. Pl. viii.

Vipera ventre cuprei coloris, Catesb. Nat. Hist. Carol. II, 1742, 46. Tab. xlvi.

The head is proportionally narrow and elongated, flattened above, and convex on the snout. The vertical plate is elongated and subpentagonal, broader anteriorly than posteriorly, with the sides slightly concave. The postorbital plates, proportionally small, are three in number. Loral large and polygonal, higher than long. There are three or four temporal shields very much developed. Dorsal rows of scales 23 or 24 in number, strongly carinated, with the keels on the posterior third of the body, constituting very conspicuous and continuous ridges, the intermediate depressions or furrows giving to the body and tail a canaliculated appearance. The lateral or outer row, however, is but slightly carinated. The tail itself is subconical, very much tapering, forming one-fourth of the entire length.

The color, as taken from life, is said to be brick-red above, tinged with green on the sides, and uniform copper-color beneath.

Prairie Mer Rouge, La.	154+1.	80.	24.	44.	11¼.	Jas. Fairie.
Carolina.	149+1.	—	23.	50¼.	—	(on dep.) Acad. Nat. Sc.

4. Nerodia Agassizii, B. & G.—Dorsal rows of scales 23, carinated except the outer row, which is entirely smooth. A second very small anteorbital; postorbitals three. Color uniform reddish brown above, with obsolete transverse narrow light bands under the epidermis; yellowish beneath.

The vertical plate is proportionally more contracted on the sides than in any of the species of this genus, and also more tapering. The occipital plates are broad and proportionally large. The eyes are rather small, resembling in that respect those of *N. taxispilota*, the latter differing however greatly from it in being provided with five more rows of dorsal scales; the scales of the outer dorsal row are proportionally large and perfectly smooth, while these are keeled in the other species. The number of subcaudal scutellæ could not be ascertained, as the only specimen at our command is destitute of a tail. The two last abdominal scutellæ are bifid.

The color, though uniform in the adult, in the immature state is blotched, as in other species of this genus; judging from the trans-

verse narrow light bands that may be seen on the back when the epidermis is removed.

Lake Huron.	147+2. — 23.	24. —	(on dep.) Prof. Agassiz.

5. Nerodia Woodhousii, B. & G.—Dorsal rows of scales 25, carinated. Three series of subquadrate black blotches, a dorsal and two lateral, the latter vertically elongated. A double yellow occipital spot. A yellow spot between the superciliaries and vertical plates. A black vitta from posterior rim of eyes to angle of mouth.

The head is broad behind, and tapers forwards, very much flattened above. The mouth is very deeply cleft. The labials are nine above and eleven below; the 5th, 6th, and 7th the largest on both jaws.

Ground-color dusky, with a dorsal series of subquadrangular black blotches, 37 to 40 in number, separated by a narrow whitish transverse line. A lateral series of vertically elongated black blotches, alternating with the dorsal series, with anterior and posterior margins nearly parallel, sometimes tapering downwards and reaching the abdominal scutellæ. The fuscous space between the lateral blotches is wider than that occupied by the blotches themselves. Along the tail, both the dorsal and lateral blotches are small and subcircular. Underneath the color is yellowish, and the scutellæ in the young, margined posteriorly with black, while in the adult the middle region of the scutellæ is unicolor. The head is brownish black, with a double yellow spot near the commissure of the occipital plates, and two spots of the same color on the commissural line between the vertical and superciliaries. A black vitta extends from the posterior rim of the eye to the angle of the mouth.

Indianola.	144+1. —	25.	27¾. —		Col. J. D. Graham.
Betw. Ind. & San Antonio.	144+1. 64.	25.	10½.	2⅜.	"
"	142+1. 79.	25.	11.	2⅞.	
Sabinal, Tex.	144+1. 68.	25.	13.	3.	"
New Braunfels, Tex.	148+1. 68.	25.	34.	7¼.	F. Lindheimer.
"	147+1. 72.	25.	25.	6¾.	"
"	145+1. 70.	25.	17.	4¼.	"

6. Nerodia taxispilota, B. & G.—Head proportionally small, subtriangular, pointed on the snout. Vertical plate broad, subquadrangular; occipitals small. Two postorbital plates; anteorbital narrow. Dorsal rows of scales 29, all carinated. Brown, with three series of subquadrangular blackish blotches.

Syn. *Coluber taxispilotus*, Holbr. N. Amer. Herp. II, 1838, 113. Pl. xxv.
Tropidonotus taxispilotus, Holbr. N. Amer. Herp. 2d ed. III, 1842, 35. Pl. viii.

The head is proportionally small, conical forwards. The eyes also are small. The vertical plate has the shape of an elongated quadrangle. The occipital plates are rather small and posteriorly attenuated. The anterior frontal plates are small and triangular, the apex of the triangle being directed forwards. There are two large postorbital plates. The superciliaries are narrow and elongated. Dorsal rows 29; their scales all carinated.

Ground-color reddish brown, with three series of subquadrangular blackish blotches, forty-six in number, the twenty-sixth opposite the anus. They embrace transversely from 7 to 10 rows of scales, and longitudinally three scales on the two anterior thirds of the body, and two scales on the posterior third. The space between the blotches is equal to the blotches themselves. The lateral series are isolated, that is to say, not contiguous to the dorsal series except sometimes towards the origin of the tail and along the latter region. The blotches extend over nine or ten lateral rows of scales, and affect from three to five scales. Equilateral on the anterior part of the body, they become narrower on the posterior part, and taper upwards. The space between is narrower by one scale. On the tail the dorsal series of blotches has almost entirely disappeared; now and then an irregular patch may be seen confluent with the lateral series, which remain conspicuous to the very tip of that organ. The lower surface of the body is yellowish white, with irregular deep chestnut-brown patches, the lateral ones contiguous to the lateral series.

Riceboro, Liberty Co., Ga. 141+1. 80. 29. 36. 9. Dr. W. L. Jones.

7. Nerodia Holbrookii, B. & G.—Head ovoid or elliptical, narrowest on the snout. Vertical plate much longer than in *N. taxispilota*. Occipitals much larger also. Three postorbitals. Loral higher than long. Dorsal scales in 27 rows, all strongly carinated. Brown, with three series of quadrangular black blotches, the blotches of the lateral series alternating with those of the dorsal.

Head and eyes proportionally larger than in *N. taxispilota*. Vertical plate subpentagonal, and more elongated than in *N. taxispilota*. Occipital plates also much more developed and broader. Inframaxillary longer. Proportion between the length of the tail and that of the body about the same as in *N. taxispilota*. The rows of scales 27 in number, and carinated; the scales themselves proportionally much larger than in *N. taxispilota*. The lateral row especially differs much in that respect.

Ground-color reddish brown, with three series of black subquadrangular blotches, forty-one in number, the twenty-fifth opposite the anus. They embrace transversely six or seven rows of scales, instead of seven or ten as in *N. taxispilota*. Longitudinally they cover three scales on the anterior portion of the body, and two posteriorly as in *N. taxispilota*. The intermediate space, however, is greater than the blotches themselves, embracing one scale more. The lateral series are contiguous to the dorsal one, and alternate regularly with it. The blotches extend on seven lateral rows, embracing three scales, while the intermediate space embraces four of them. Beneath yellowish white, with small and irregular brown blotches scattered along the sides.

Prairie Mer Rouge, La.	144+1.	70. 27.	35. 8.	Jas. Fairie.
"	141+1.	63. 27.	33. 7.	"

Genus **REGINA**, Baird & Girard.

Gen. Char. Body slender; tail subconical, very much tapering, forming one-third or one-fourth of the total length. Head conical, continuous with the body, and proportionally small. Eyes large. Mouth deeply cleft. Labials small. Loral and nasals large. Scales carinated. Cephalic plates normal. Anterior orbitals 2, occasionally one; posterior 2, occasionally 3. Last and sometimes last but one abdominal scutellæ bifid or divided. Subcaudal scutellæ all divided. Dorsal rows of scales 19–21. Abdominal scutellæ 132–162. Subcaudal 52–86. General color five or more longitudinal dark bands on a lighter ground. Abdomen unicolor, or likewise provided with similar bands. Aquatic.

1. Regina leberis, B. & G.—Chestnut-brown, with a lateral yellow band, and three narrow black dorsal vittæ. Abdomen yellowish, with four brown bands, two of which are lateral and two medial. Dorsal rows of scales 19, all carinated.

Syn. *Coluber leberis,* Linn. Syst. Nat. ed. x, I, 1766, 216.—Gm. *Linn.* Syst. Nat. ed. xiii, I, iii, 1788, 1086.—Shaw Gen. Zool. III, iii, 1804, 433.

Coluber septemvittatus, Say, Journ. Acad. Nat. Sc. Philad. IV, 1825, 240.—Harl. Journ. Acad. Nat. Sc. Philad. V, 1827, 355; and Med. & Phys. Res. 1835, 118.

Tropidonotus leberis, Holbr. N. Amer. Herp. IV, 1842, 49. Pl. xiii.—Dekay, New York Fauna, Rept. 1842, 45. Pl. xi, fig. 23.

Head small, very much depressed, flattened on the region behind the orbit, sloping anteriorly. Vertical plate pentagonal, proportionally broad. There are two anteorbitals, the upper one the larger; and two postorbitals, the upper one the smaller. The loral is large and higher than long. One temporal shield only. Upper labials, 8; 6th and 7th largest. Lower labials 10; 5th and 6th largest. Scales regularly elliptical, slightly notched posteriorly, and all of them carinated, gradually diminishing in width from the sides towards the middle line of the back. Those of the outer row one-third broader than the rest, and posteriorly subtruncated.

Ground-color dark chestnut or chocolate-brown above, marked with three narrow black vittæ or bands, one covering the medial row of dorsal scales, and two (one on each side) following the fifth row. A lateral yellow band occupies the upper half of the outer row and the whole of the second row, thus broader than the black bands above. Immediately below, and contiguous to it, a somewhat larger brown band covers the lower half of the outer row of scales and the extremity of the abdominal scutellæ. The abdomen is yellowish, provided along its middle region with two approximate brown bands, similar though a little narrower, and interrupted by the yellowish edge of the scutellæ. The tail beneath is almost rendered uniformly brown by the confluence of the bands.

Carlisle, Pa.	144+2. 81. 19.	$23\frac{1}{4}$. $6\frac{1}{8}$.	S. F. Baird.
"	142+1. 86. 19.	$21\frac{3}{8}$. $6\frac{3}{8}$.	"
"	142+1. 71. 19.	$14\frac{1}{2}$. $3\frac{5}{8}$.	"
"	145+1. 78. 19.	$9\frac{7}{8}$. $2\frac{5}{8}$.	"
"	140+1. 75. 19.	$8\frac{3}{8}$. $2\frac{1}{4}$.	"
Foxburg, Pa.	151+1. — 19.	23. —	"
Grosse Isle, Mich.	147+1. 64. 19.	$18\frac{3}{4}$. $4\frac{3}{8}$.	Rev. Chas. Fox.
Highland Co., Ohio.	149+1. 76. 19.	$11\frac{3}{8}$. $2\frac{3}{4}$.	Jos. M.D.Mathews.
Washington, D. C.	141+1. 81. 19.	$11\frac{1}{2}$. $2\frac{1}{2}$.	(on dep.) Nat. Inst.

2. Regina rigida, B. & G.—Greenish brown above; two deep brown vittæ along the dorsal region. Contiguous edges of the outer row of scales and abdominal scutellæ finely margined with brown. The middle region of the outer row like the abdomen, as is that of the second row, but less distinctly. Abdomen reddish yellow, with two series of black spots on the middle region, approaching each other towards the anterior region of the body. Dorsal rows of scales 19, carinated except the outer row, which is smooth.

Syn. *Coluber rigidus*, Say, Journ. Acad. Nat. Sc. Philad. IV, 1825, 39.—Harl. Journ. Acad. Nat. Sc. Philad. V, 1827, 355; and Med. & Phys. Res. 1835, 118.

Tropidonotus rigidus, Holbr. N. Amer. Herp. III, 1842, 39. Pl. x.

Head proportionally larger than in *R. leberis*, much less depressed and shorter on the snout. Its upper surface is flat, the snout convex, the high and large rostral making it less sloping. Vertical plate subhexagonal and elongated. Occipitals truncated posteriorly. Superciliaries narrow and tapering forwards. Anterior pair of frontals very small. Two postorbitals of nearly equal size, and two ante-

orbitals, the upper one much larger than the lower. Loral subcircular or oblong. An elongated and narrow temporal shield, followed by two or three smaller. Upper labials 7, 5th and 6th very large. Lower labials 11, 6th and 7th largest. Scales elliptical, narrower along the middle line of the back, carinated, except the outer row, which is perfectly smooth, and furthermore distinguished by the scales having their height greater than their length. The second row is noticeable for its size, and sometimes for its want of carination, which in all cases is obsolete.

The ground-color is uniform greenish brown, but each scale on the flanks is provided with a small blotch of deeper brown at its base. The brown vittæ of the back cover each one entire row, and the half of the two adjoining rows, separated on the dorsal line by one row and two half-scales of the ground-color. Beneath dull yellowish. Along the middle region of the abdomen there are two series of elongated deep brown blotches approaching each other towards the anterior region and under the tail, sometimes however not extending beyond the anus.

Southern States.	135+1. 71. 19.	12¾.	3¼.	Rev. Dr. J. G. Morris.
Riceboro, Ga.	135+1. 56. 19.	7½.	1½.	Dr. W. L. Jones.
Pennsylvania.	132+1. 52. 19.	21.	4.	(on dep.) Acad. Nat. Sc.

3. Regina Grahamii, B. & G.—Brown, with a dorsal light band margined on either side with a black line or vitta. A broad band of yellow on the flanks, margined likewise with a black vitta. Abdomen unicolor, yellowish. Dorsal rows of scales 20, all carinated.

Head elongated, slender, depressed, and flattened above, slightly sloping on the snout. Occipitals elongated and posteriorly pointed. Vertical plate subpentagonal, narrower anteriorly. Superciliaries proportionally well developed, as also the anterior pair of frontals. Two anteorbitals, lower one a little the larger. Three postorbitals, the lower one very small and almost suborbital in its position. Loral elevated. Rostral well developed. Upper labials 7, 5th and 6th largest. Lower labials 10, 5th and 6th largest. Dorsal rows of scales 20, all carinated. The three outer rows sensibly the largest, and truncated posteriorly, while the remaining ones are tapering.

A light-brown band along the dorsal line, covering one and two half-rows of scales. On each side of this a narrow black vitta covering one and a half scales. Next succeed three rows of scales, uni-

formly brown. Then again, a black vitta covering an entire row of scales, and the edge of the row immediately under it, (the third.) The first, second, and most of the third outer rows of scales are straw-color. This yellowish band extends forwards, passing under the head to the extremity of the snout. A black line is seen running from behind the neck to the anus, affecting the extremity of the scutellæ, and occasionally the lower edge of the outer row of scales. The abdomen is uniform light straw-color; a medial nebulous blackish band under the tail is observable.

Rio Salado, Tex. 161+1. 57. 20. 10¾. 2. Col. J. D. Graham.

4. Regina Clarkii, B. & G.—Yellowish brown, with four longitudinal bands of deeper brown. Abdomen dull yellow, with two clouded brown bands dotted with black. One anteorbital. Dorsal rows of scales 19, all carinated.

This is the largest species of the genus. Head elongated, conical from occiput to the extremity of the snout, depressed above, subconcave on the occipital region, slightly sloping on the snout. Cephalic plates very much developed. Vertical subpentagonal, broader anteriorly, though slightly tapering. Anterior pair of frontals quite large. Three and sometimes only two postorbitals, variable in comparative size; when there are three, the lowermost is suborbital. One anteorbital, large. Loral well developed, longer than high. Upper labials 8, 5th and 6th largest, the latter very large. Scales of the body elliptical, rounded posteriorly. Outer row somewhat larger than the rest, and very slightly carinated.

Color of head dirty brown, occipital and temporal region blackish. Each of the four longitudinal bands of deep brown covers two rows of scales. The intermediate yellowish brown spaces embrace each two rows of scales also, except the dorsal one, which has three rows. Each of the abdominal clouded bands embraces one-fourth of abdominal space, inside of which is left a yellow space one-fourth of the width, and exteriorly another yellow space one-eighth of the width of abdominal space. The tail beneath is blackish, owing to the confluence of the abdominal bands, interspersed with yellowish maculæ.

Indianola.	132+1.	57.	19.	31¾.	6½.	Col. J. D. Graham.
"	—	—	—	—	—	"
"	—	—	—	—	—	"
"	—	—	—	—	—	"

Genus **NINIA**, Baird & Girard.

Gen. Char. Head elongated, ovoid, distinct from the body. Cephalic plates normal. Two nasals. A large loral produced into the orbit between the anteorbitals, which are two in number. Two postorbitals. Scales all carinated. Subcaudal scutellæ bifid.

Ninia diademata, B. & G.—Body above deep chestnut; on the middle of each scale an elongated yellowish spot. A yellow occipital blotch. Abdomen yellowish, with a medial brown band. Dorsal scales in 19 rows.

The vertical plate is hexagonal, as broad anteriorly as long; anterior angle very obtuse; posterior angle acute. The occipitals are very much developed, rounded exteriorly and posteriorly, angular anteriorly. The postfrontals are likewise remarkable for their great development; they are obtusely quadrilateral, being somewhat longer than broad. The prefrontals are proportionally reduced, angular, broader outside. The rostral is broad and well developed. The nostril opens through the middle of the posterior margin of the prenasal, and is seen from above; the postnasal is subquadrilateral, higher than long. The loral occupies a large portion of the face; it is angular in shape, and behind extends to the orbit between the anteorbitals. The lower anteorbital is subtriangular, resting on the 4th upper labial, contiguous to the commissure of the 3d; the upper anteorbital is regularly quadrangular, and visible from above. There are two postorbitals, subquadrangular in shape. The superciliaries are rather small, narrow, and elongated. Anterior temporal shield very large, the rest resembling scales. The eyes are proportionally large and circular. The mouth deeply cleft. Upper labials 6; 5th largest. Lower labials 6; 4th largest.

Body subcylindrical, deeper than broad; tail very slender and tapering, about one-third of the total length. The scales are all carinated, and constitute 19 rows, the outer row considerably larger, the rest diminishing towards the back. Postabdominal scutella appa-

rently entire; the shrunken state of the specimen did not allow a satisfactory examination to be made.

The ground-color of the head and body above is a deep chestnut. On the posterior part of the head is a yellow ring, sending a narrow stripe along the upper labials to the orbit. Each scale is provided on its middle with a narrow and elongated yellow dot, very conspicuous on the outer row of scales, giving at first the impression of a narrow vitta along the sides. The exterior edge of the abdomen is of the same color as the back. The abdomen is yellowish; a medial chestnut band extends from the head to the tip of the tail, interrupted only by the narrow yellowish margin of the scutellæ themselves.

Orizaba, Mex. 136. — 19. $8\frac{5}{8}$. $2\frac{3}{4}$. Jas. Fairie.

Genus **HETERODON**, Pal. de Beauv.

Gen. Char. Body short, stout, tail short. Head, neck, and body capable of excessive dilatation. Posterior palatine teeth longer. Head broad, short; outline of mouth very convex, on a single curve. Orbit enclosed by a continuous chain of small plates, the circle completed above by the superciliaries. Rostral prominent, its anterior face very broad, and turned up; its ridge above sharp. Behind it a median plate, either in contact with the frontals or separated by small plates. Frontals in two pairs. Nasals two. Loral one or two. Dorsal rows of scales 23–27, carinated. Abdominal scutellæ 125–150, posterior bifid. Subcaudal scutellæ all bifid.

Colors light, with dorsal and lateral darker blotches, or else brown, with dorsal transverse light bars. Sometimes entirely black.

The species exhibit a very threatening appearance when alive, in flattening the head, hissing violently, &c. but are perfectly harmless.

Syn. *Heterodon*, Pal. de Beauv. in *Latr.* Hist. Nat. des Rept. IV, 1799.

A. *Azygos behind the rostral, in direct contact with the frontals.*

1. Heterodon platyrhinos, Latr.—Occipitals and vertical longer than broad, about equal in length. Centre of eye anterior. Dorsal rows 25, all carinated, the outer sometimes smooth. Keels of the scales extending to their tips. Scales on the back quite linear anteriorly, posteriorly they are much broader. Color yellowish gray, or brown, with about 28 dark dorsal blotches from head to anus, and 15 half-rings on the tail. One or two lateral rows. Beneath yellowish. A dark band across the forehead in front of the vertical, continued through the eye to the angle of the mouth.

Syn. *Coluber heterodon*, Daud. Hist. Nat. Rept. VII, 1799, 153. Pl. lx. fig. 28.—Say, Amer. Journ. of Sc. I, 1818, 261.—Harl. Journ. Acad. Nat. Sc. Philad. V, 1827, 357; and Med. & Phys. Res. 1835, 120.

Heterodon platyrhinos, Latr. Hist. Nat. Rept. IV, 1799, —— 32, fig. 1–3. —Holbr. N. Amer. Herp. II, 1828, 97. Pl. xxi; and 2d ed. IV, 1842, 67. Pl. xvii.

Hog-nose Snake; Blowing Viper.

Vertical plate hexagonal, narrower behind; longer than broad; angles all distinct, lateral outlines straight. Postfrontal large, the lateral angle extending down to the loral; the two postfrontals separated anteriorly by the azygos or postrostral. Prefrontals smaller, entirely separated by the azygos. Rostral with the outline spherical angled, subacute at the apex, its upper surface compressed into a sharp ridge, which, prolonged backwards between the nasals and the prefrontals, connects with the azygos. This is linear, subpentagonal, acute-angled behind, where it wedges between the postfrontals. Superciliaries large. Scales behind the head distinctly carinated. Eye large. Line connecting tip of rostral with the postinferior corner of the last labial passes over the lower part of the eye. A triangular nasal, with the corners rounded, joined by its apex to the exterior angle of the postfrontals. Nostrils valvular, situated entirely in the posterior nasal, the anterior edge formed by the anterior nasal. Labials 8 above, 6th largest, the 3d to the 6th in contact with the suborbitals: two large temporal shields above the three posterior labials. Centre of the eye anterior to the middle of the chord connecting the apex of rostral and posterior end of labials and over the middle of the 5th labial. Outline of upper jaw convex. Lower labials eleven.

Body stout and short. Tail very short, and rapidly tapering, rather thicker than the thinnest part of the body. Dorsal rows 25. Scales all distinctly carinated, (including those on the back of the head,) except the outer row, which is either perfectly smooth, or presents very obsolete carination. The ridges on the 2d row much less distinct than the rest.

Color reddish brown above, with dark blotches. A series of 28 quadrate, dorsal, uniform black blotches from head to anus, each from 2 to 3 scales long, and 7 to 9 wide, separated by regular brownish yellow intervals of 1½ to 2 scales. The blotches anteriorly are nearly square, posteriorly they are transversely elongated. Opposite the intervals, and, indeed, bounding them on either side, is a second series of small circular blotches on the 4th to the 8th lateral rows, and separated only by a narrow interval from the corner of the dorsal blotches. Sometimes there are faint traces of small blotches between the upper lateral series. Intervals between the lateral rows of blotches yellowish or reddish brown, darker than those on the back; outer dorsal rows greenish or yellowish white. On the tail there are 15 black half-rings, interrupted on the subcaudal scutellæ,

the scales on the tail larger than on the greater part of the body. In young specimens is distinctly visible a second series of still smaller blotches, below the one just mentioned, there being two of these opposite each one of the former, and placed on the 2d, 3d, and 4th exterior rows. Beneath greenish yellow, with obsolete greenish brown blotches, indistinctly visible through the epidermis, sometimes more conspicuous in young specimens.

There is a transverse black or dark bar on the forehead, crossing the posterior half of the postfrontals, involving only the anterior edge of the vertical, and the anterior corners of the superciliaries. Behind this a dark patch, with its anterior margin a little back of the middle of the vertical, and involving the adjoining margin of the superciliaries and occipitals, together with the greater portion of the occipitals; sometimes with a light spot in the middle: the light space included between the two patches appears to extend continuously backwards to the neck; above a dark vitta from the back part of the orbit to the posterior labial, itself a continuation of the frontal vitta. An elongated narrow vertebral spot behind the junction of the occipitals, and generally isolated from them, on each side of which is a similar patch widening behind.

This species is subject to great variations of color. Sometimes the sides of the dorsal blotches pass insensibly into the ground-color, so as to become transverse bands. At others they are light internally, with a narrow margin of black. Occasionally there is much black on the abdomen (in young specimens). The ground-color varies from gray to bright yellow, and sometimes even red. It may also happen that, by the confluence and extension of the darker margins, we have light bars on a dark ground, as on a specimen from the Scioto valley, Ohio, where, with the other characters similar, the color is of a dark brown above and on the sides, with transversely quadrate brownish ash-colored spots along the back, some one and a half or two scales long, 9 or 10 wide, and at intervals of about three scales. Of these spots there are 28 from head to anus, and about 9 on the tail, where they form half rings, with intervals a little larger than themselves.

Carlisle, Pa.	129+1.	53.	25.	28.	6.	S. F. Baird.
"	123+1.	49.	25.	24½.	5.	"
Clarke Co., Va.	143+1.	46.	25.	19.	2¼.	Dr. C. B. Kennerly.
"	127+1.	—	25.	11.	2	"
Anderson, S. C.	—	—	—	—	—	Miss C. Paine.

Mississippi.?	135+1. 51. 25.	10.	1½.	Dr. B. F. Shumard.
" ?				D. C. Lloyd.
Scioto Valley, Ohio.	148+1. 45. 25.	26.	4.	(on dep.) Dr. J. P. Kirtland.

2. Heterodon cognatus, B. & G.—Vertical longer than occipitals. Dorsal rows of scales 23–25; outer smooth; next scarcely carinated. Scales of the rest with keels extending to their tips. Scales broader than in preceding. Disproportion between scales of the back, before and behind, not conspicuous. Light chestnut, with 20 yellow blotches from head to anus, and 9 on the tail. Beneath yellow.

Vertical plate pentagonal, elongated. Frontals moderate, of nearly the same length. Azygos rather broad, similar in its relations to that of *H. platyrhinos*. Rostral quite fully developed. Occipitals small, less than in *H. platyrhinos*. Scales back of head distinctly carinated. Centre of eye above the middle of the 5th labial. Orbital chain of 10–11 plates. Loral rather large, triangular. Nasals moderate. Labials 8. Penultimate rather longer than high.

Scales diminishing in width towards the back, although not becoming as linear as in *H. platyrhinos*. Scales on the hinder part of back scarcely wider than those in front.

Color above light chestnut, with transverse, sometimes more or less oblique, dorsal bars between the 7th exterior rows. These bars are bright yellow, tinged with brown in the centre, and with a darker marginal shade of the ground-color. Of these bars there are 28, from head to tail, the 20th opposite to the anus, each about ten scales long, about nine broad, and separated by intervals of from four to six scales. The proportional difference between the two colors in the tail is much as in *H. platyrhinos*. Color beneath clear dull yellow. Exterior dorsal scales mottled brownish yellow, more or less spotted and margined with brighter yellow. On separating the skin a dark spot is seen at each end of the dorsal patches, between and around which the color is yellow. Head olivaceous yellow, with the usual markings of the genus obsolete. An elongated black patch behind the angle of the jaws on each side.

Somewhat similar to *H. platyrhinos*, but the scales anteriorly are wider, nor is there that disproportion between the scales on the back before and behind. The occipitals are shorter. From *H. atmodes*, the narrower intervals between the caudal light band, the scales cari-

nated on the back of head as well as elsewhere to the tip, the more prominent rostral, (the line from the tip to the lower posterior angle of the last labial passes over the eyeball,) &c. will at once distinguish it.

A much mutilated, but much larger specimen from New Braunfels agrees with this, although the rostral is proportionally less; in other characters it is very similar. The intervals between the light bars, and the sides at their extremities are, however, much darker.

A small specimen from Indianola has much the same distribution of color as described in the young *H. platyrhinos*. The principal differences are seen in the larger head, stouter body, shorter occipitals, narrower dark line across the superciliaries and vertical, broader scales anteriorly, &c. The ground-color is mottled chestnut, with subquadrate brown blotches, indistinct at the outer edges, a circular dark spot opposite each light dorsal interval, like the dorsal series surrounded by a lighter areola; beneath each dark spot a pair still smaller. Below greenish white, blackish posteriorly, with narrow blotches of black in front. Distinct patch from eye to the last upper labial.

Indianola.	130+1. 58. 23.	26. 6.	Col. J. D. Graham.
"	129+1. 51. 25.	11. 2.	"
New Braunfels, Tex.	124+1. 56. 25.	27. 6.	F. Lindheimer.

3. Heterodon niger, Troost.—Vertical plate as long as the occipitals. Rostral prominent. Dorsal rows of scales 25, the exterior smooth, the 2d row obsoletely carinated, the rest with the scales distinctly carinated, the carinæ extending quite to the tip. Uniform black above, slate-color beneath.

Syn. *Vipera nigra*, Catesb. Nat. Hist. Carol. II, 1743, 44. Pl. xliv.

Scytale niger, Daud. Hist. Nat. Rept. V, 1799, 342.—Harl. Journ. Acad. Nat. Sc. Philad. V, 1827, 367; and Med. & Phys. Res. 1835, 130.

Coluber cacodemon, Shaw, Gen. Zool. III, 1802, 377. Pl. cii.

Coluber thraso, Harl. Med. & Phys. Res. 1835, 120.

Heterodon niger, Troost. Ann. Lyc. Nat. Hist. N. York, III, 1836, 186.—? Holbr. N. Amer. Herp. 1st ed. II, 1838, 105. Pl. xxiii; and 2d ed. III, 1842, 63. Pl. xvi.

Black Viper; Spreading Adder.

Postfrontals large, extending to the loral. Prefrontals smaller. Azygos rather large, separating the prefrontals entirely, and the postfrontals anteriorly: in a line with the rostral. Rostral

broad. Keel acutely distinct. Scales on the back of head keeled, though obsoletely in those next to the occipital plates. The line from tip of snout to lower angle of posterior labial, crosses the lower part of the eye, whose centre is a little in advance of the middle of this line. Orbital chain of 9 plates. Loral triangular, truncated above. Nasals rather large, less developed than in *H. platyrhinos*. Upper labials 8; 3d–6th in contact with suborbitals. Centre of eye above the juncture of the 4th and 5th.

Scales distinctly carinated, except the outer row, which is smooth, and the second, on which the carination is very obsolete, sometimes quite smooth. All the scales diminish gradually to the back, where they are quite linear; posteriorly, however, they are broader.

Color above and on the sides entirely dull black, beneath rather light slate-color, shading into milk-white on the chin and on the edge of the upper labials. The exterior rows of scales shade gently from the color of the back to that of the belly.

The *Heterodon niger* bears quite a close relationship in the character of the plates and scales to *H. platyrhinos*, from which the principal difference lies in the color. Although this species greatly resembles in color the black variety of *H. atmodes*, they may be readily distinguished. The rostral of *H. niger* is well developed, high, broad, and with the dorsal carina acute and well marked. The carination on the scales back of the head is delicately distinct, as also upon the other scales, the keel extending to the very tip. The scales on the back are linear and narrow, but become much broader in proportion towards the tail. The occipitals are longer, and the head in front of the eye longer in proportion to the part behind it. No bands evident, even obsoletely. The other differs in all these respects: rostral low, and the keel more rounded; scales on back shorter, and anteriorly rather broad, and the disproportion with those posteriorly much less conspicuous; carinæ not extending to the tip; faint bars seen indistinctly across the black of the back, &c.

Carlisle, Pa. ♀	140+1. 49. 25. 36. 6.	S. F. Baird.

Specimens from the South differ simply in being rather darker on the sides and beneath.

Abbeville, S. C.	145+1. — 25. 26. —	Dr. J. B. Barratt.
Kemper Co., Miss.	126+1. 53. 25. 28. 5¾.	D. C. Lloyd.

4. Heterodon atmodes, B. & G.—Vertical plate longer than occipitals, which are small, and as broad as long. Azygos in contact with the frontals. Rostral low, obtuse, and very little prominent. Eye more anterior. Dorsal rows 23 or 25. Outer row smooth, 2d and 3d very obsoletely carinated. Scales broader, smoother, and more rounded than in *H. platyrhinos.* Keel not extending to the tip. Black, with 18 transverse yellowish bands on the body, and 7 on the tail; the dark intervals much broader than the light bands, sometimes entirely black.

Vertical plate hexagonal, narrower behind, and more elongated than in *H. platyrhinos;* lower than the occipitals. Postfrontals large, extending down to the loral. The anterior frontals rather larger than in *H. platyrhinos,* separated by the azygos and rostral. Rostral small, moderately recurved, much smaller and less conspicuous than in *H. platyrhinos.* Superciliaries long, narrower than in *H. platyrhinos.* Scales on back of the head broad, flat, carination very obsolete. Imaginary line connecting tip of rostral, and posterior angle of last upper labial passes entirely below the eye, whose centre is anterior to the middle of this line. Eye large, its centre above the middle of the 4th labial. Loral nearly square, rather narrower above. Nasals small, which with the less development of the rostral brings the eye more forwards. Labials 7 above. Owing to a greater development of the suborbital series, (of 9 plates,) the labials are lower than in *H. platyrhinos.* The posterior upper angle of the 2d labial, as well as the 3d, 4th, and anterior upper angles of the 5th, are in contact with the suborbitals. The difference from *H. platyrhinos* in this respect is caused by the much greater size of the 2d or 3d labials, the first being much smaller than all the rest.

Dorsal rows of scales 23; exterior smooth, 2d and 3d very obsoletely carinated, rest of scales more so, but in all cases less distinctly than in *H. platyrhinos.* The keel on each scale does not extend to the tip, but becomes obsolete at a point from the tip of one-half to one-fifth of the length; while in *H. platyrhinos* it extends very nearly, if not entirely to the extreme tip, especially on the back. The scales also are broader and more oval. The tail is slenderer and more tapering than in *H. platyrhinos,* and is not as thick as the posterior part of the body.

Color above lustrous pitch-black, crossed by 18 transverse light yellow bands, from head to anus, and 7 on the tail; sides mottled with black and yellowish. Beneath yellowish, blotched with black.

The pattern of coloration is probably similar to that of *H. platyrhinos*, except that the outer edges of the dorsal blotches are confluent with the irregular markings of the sides, instead of being quite distinctly defined. Occasionally black blotches opposite the transverse light marks are evident. The light bands are sometimes interrupted and sometimes oblique; their extent is about the same as in *H. platyrhinos*. The black intervals between these light bars are much longer than in *H. platyrhinos*, occupying from 5 to 6 scales anteriorly, and on the tail from 6 to 7. The light bands may have been orange in life. On the side of the head is a broad distinct black stripe from the posterior part of the eye to the posterior end of the truncated last labial, and continuous with an obscured black band across the forehead, on the posterior half of the postfrontals. Lower jaw and sides of head blotched with black.

Georgia. 131+1. 56. 23. 25. 5½. Prof. C. B. Adams.

A young specimen, apparently of this species, has the head much more depressed than in individuals of *H. platyrhinos* of the same size. The general color above is lead-gray, with transverse bands of lighter gray on the back, margined by dark chestnut, which shades gradually into the gray. The other features are well preserved, except that the rostral, as usual in young specimens, is higher.

Charleston, S. C. 137+1. 54. 25. 12½. 1¾. Dr. S. B. Barker.

Another larger specimen has the lateral spots rather more distinct. The dorsal bands are pale rose-color, (in alcohol). It agrees in the shorter occipitals, smaller number of bands, less carinated scales, lower rostral, &c.

Charleston. 141+1. 49. 25. 17. 2¾. C. Girard.

A large specimen from Charleston agrees in its external anatomy, but at first sight appears entirely black above, and of an irregular slate-color beneath. On a closer examination, however, the transverse bands are obsoletely visible, especially towards the tail. Traces of the markings on the head may likewise be distinguished. Perhaps often confounded with the true *H. niger*.

Charleston, S. C. 137+1. 53. 23. 26. 4¼. Dr. S. B. Barker.

B. *Azygos plate behind the rostral separated from the frontals by small plates.*

5. Heterodon simus, Holbr.—Vertical plate as broad as long, much longer than the occipitals. Rostral broad and high. Azygos encircled by five or eight small plates. Mouth very short. Dorsal rows 25, the three or four externals smooth. Dorsal series of 35 blotches, with one to three other series on each side. Abdomen yellowish, scarcely maculated. A narrow black band across the forehead in front of the vertical, and passing through the eye across one labial to the angle of the mouth.

Syn. *Coluber simus*, Linn. Syst. Nat. ed. xii, I, 1766, 216.—Gm. *Linn.* Syst. Nat. ed. xiii, I, iii, 1788, 1086.

Heterodon simus, Holbr. N. Amer Herp. IV, 1842, 57. Pl. xv.

Heterodon platyrhinos, Schl. Ess. Phys. Serp. Part. descr. 1837, 97. Pl. iii, figs. 20–22.

? *Vipera capite viperrens*, Catesb. Nat. Hist. Carol. II, 1743, 56. Tab. lvi. Hog-nose Snake.

Vertical plate subheptagonal, sometimes nearly triangular; with three sides anteriorly, the lateral against the postfrontals, the middle against the azygos plates, the sides very obtusely angled. Superciliaries rather short, broad. Occipitals very short, almost as long as broad. Postfrontals moderate, the exterior angle scarcely reaching the angle of the loral; the two separated by three small plates posterior to the azygos. Anterior frontals not much smaller. Azygos plate resting anteriorly against the rostral, and touched by the inner angle of the prefrontal: there is a small plate on each side, between it and the notch at the junction of the anterior and postfrontals, while behind, the space between it, the postfrontals, and the vertical is occupied by the three small plates already mentioned. This azygos is thus surrounded on the sides and posteriorly by five small plates, (this number is sometimes greater). Rostral broad and high, much recurved. Eyes moderate, situated posterior to the centre of imaginary line connecting the last labial and rostral, which would pass nearly through its centre. Loral subtriangular, acute above, scarcely reaching to the exterior angle of the postfrontal, a small plate sometimes intervening. Nasal plates rather short and high; nostril occupying most of the posterior one, its infero-anterior wall constituted by the first labial, its lower by a small plate. Labials 7 above; increasing very rapidly from the diminutive first; 5th and 6th largest;

all much higher than broad. Lower labials 9. Curve of upper jaw very convex and short.

Scales back of the head short, curved, obsoletely carinated. Dorsal rows of scales 25, outer rows smooth, sometimes only three, the carination slight, increasing to the medial row. Scales shorter and broader than in the other type, becoming narrower on the back; those behind rather narrower than before. Body contracted at the anus, then expanding or swelling on the tail, which is thick throughout, tapering suddenly at the tip. Scales on the tail longer and broader than those of the upper part of the body in front; carination not very distinct, inferior three rows truncated behind, especially the highest.

A dorsal series of transverse black blotches, 35 from head to tip of tail, the 27th opposite the anus. These are sometimes oblique, but generally transverse, and with the anterior and posterior margins parallel: they are about 9 scales wide, and three to four long, with light brownish yellow intervals one or one and a half scales wide. On each side, and opposite the intervals, is a distinct series of subquadrate or circular black spots on the 6th–9th rows, not touching those on the back, and between them a dusky shade opposite the dorsal spots. Below these again are usually two smaller blotches to each spot. Intervals between the spots mottled yellowish brown. Beneath yellowish, with obsolete small brown blotches. On the tail there are 9 half-rings, rather wider than the light intervals, and somewhat contracted above.

A narrow black line crosses the forehead, on the posterior half of the postfrontals, and just margining the vertical; this passes through the centre of the eye, and is continued to the postlabial. A medial patch of black expanding behind, starts from the commissure of the occipitals, from which plates others, one on each side, pass across the angle of the jaws, the three confluent with the dark color in the occipitals. In *H. platyrhinos* this medial patch is isolated, and not in contact with the occipital one.

Charleston, S. C. 117+1. 35+9. 25. 18. 3½. C. Girard.

Some specimens from Abbeville, S. C., vary in having the rostral separated from the prefrontals by two or three small plates, and the azygos entirely cut off from the frontals by intervening plates. The lower wall of the rostral is constituted by two small plates: there is a second small plate above the loral; in fact a general tendency to

break up into small plates. The markings on the back are restricted to a dorsal series, with a dusky shade opposite, and a lateral series opposite the light yellowish intervals; the ground-color of the sides a quite uniform yellowish brown. Specimens from Mississippi have the dorsal spot smaller and nearly circular.

Abbeville, S. C.	130+1. 55. 27.	15½.	1¾.	Dr. J. B. Barratt.
"	119+1. 46. 25.	19.	3¼.	"
"	130+1. 32. 25.	14½.	1¾.	"
"	132+1. 30. 25.	12.	1½.	"
Mississippi.	132+1. 34. 25.	16.	2.	Dr. B. F. Shumard.
"	132+1. 39. 27.	14.	2.	"

6. Heterodon nasicus, B. & G.—Vertical broader than long. Rostral excessively broad and high. Azygos plate surrounded behind and on the sides by many small plates (12–15). A second loral. Labials short and excessively high. Dorsal rows of scales 23, exterior alone smooth. A dorsal series of about 50 blotches, with four or five others on each side. Body beneath black. A narrow white line across the middle of the superciliaries; a second behind the rostral. A broad dark patch from the eye to the angle of the mouth, crossing the last two labials.

Syn. *Heterodon nasicus*, B. & G., Reptiles in *Stansbury's* Expl. Valley of Great Salt Lake, 1852, 352.

Vertical plate very broad, subhexagonal. Occipitals short. Rostral very broad, high, more than in the other species, outline rounded. The interval between the opposite frontals, the rostral, and the vertical occupied by a number of small plates, from 10 to 12, or more, arranged without any symmetry, on each side and behind the small azygos. The base of the rostrals between the opposite anterior nasals, is generally margined by these small plates, which sometimes, too, are seen between the vertical and the anterior portion of the superciliaries. This crowding of plates causes the anterior part of the forehead to be broader than in *H. simus*. Eye small, its centre rather posterior to the middle of the imaginary line connecting the tip of rostral with the lower angle of the postlabial, which line scarcely crosses the eyeball. Orbital plates, 10–13 in number. Loral triangular, rather longer than high, separated from the frontal by a small plate. Nasals rather short, occasionally with the lower part of the nostril bounded by a small plate. Labials 8 or 9 above, all of them higher than long; indeed, their vertical extension is

much greater than in any other species: the 6th highest, centre of eye over the junction of the 5th and 6th.

Dorsal rows of scales 23, outer row smooth, rest all distinctly carinated, the keels extending to the ends of the scales; those just behind the occipital plates truncated, with obsolete carinæ. Scales on the hind part of the body rather broader and shorter than anteriorly; the inequality scarcely evident in large specimens.

Ground-color light brown, or yellowish gray, with about 50 dorsal blotches from head to tip of tail; the 39th opposite the anus. These blotches are quite small, rather longer transversely, subquadrate, or rounded, indistinctly margined with black, (obsoletely on the outside); they cover 7 to 9 scales across, are 2 to 2½ long, and separated by interspaces of 1½ scales, which are pretty constant throughout, though rather narrower on the tail. On each side of the dorsal row may be made out, under favorable circumstances, four alternating rows of blotches; the first on the contiguous edges of the scales of the first and second exterior dorsal rows; the second on the scales of the 3d row, and the adjacent edges of those in the 2d and 4th; the third on the scales of the 4th, 5th, and 6th, and the adjacent edges of the 3d and 7th; and the fourth on the scales of the 6th, 7th, and 8th rows, and the adjacent edges of those of the 5th. This last is opposite the intervals of the dorsal series; the rest alternate with it. The central inferior surface of the abdominal scutellæ is black, sharply variegated with quadrate spots of yellowish white; the portion of the scutellæ entering into the side of the body is yellowish white, with that part opposite the dorsal intervals dark brown, thus, in fact, constituting a fifth lateral series of blotches, alternating with the lowest already mentioned. The throat and chin are unspotted. The head is light brown, with a narrow whitish line finely margined before and behind with black, which crosses in front of the centre of the vertical, and through the middle of the superciliaries: a second similar but more indistinct line runs parallel to this, just behind the rostral, and extending down in front of the eye. A third equally indistinct and similar line crosses the posterior angle of the vertical, and runs back on the side of the neck, behind the labials and temporal shields. There is a broad brown patch from the back part of the eye to the angle of the mouth, across the penultimate and last labial. The coloration is thus very different from that of *H. simus*, where there is a distinct narrow black band across the forehead scarcely involving the vertical, and passing through the eye to

the angle of the mouth across the last labial. Behind this a much broader yellowish band, continued without interruption into the neck behind the angle of the mouth. In *H. nasicus* the most conspicuous feature is a narrow white band, much narrower than the darker patch before and behind it. The dark patch, to the angle of the mouth, is much broader, continuous as it were, with the broad bar between the middle and anterior light lines, which corresponds with the narrow black line of *H. simus*. The other distinguishing features are evident. The three dark patches behind the head are much as in *H. simus*.

In the larger specimens from Sonora and the Copper Mines, the ground-color is yellowish gray, each scale minutely punctate with brown. The blotches are all obsolete, only one dorsal and two lateral on each side being defined by darker shades. The blotches on the sides of the abdomen are wanting, but the black in the middle is strongly marked. The other characters, however, are preserved, except that the exterior row of dorsal scales is more or less carinated.

Rio Grande.	138+1.	45.	23.	$7\frac{3}{4}$. $1\frac{1}{4}$.	Gen. S. Churchill.
Red River, Ark.	148+1.	40.	23.	12. $1\frac{1}{2}$.	Capts. Marcy & McClellan.
Ft. Webster, Santa Rita del Cobre.	146+2.	34.	23.	21. $2\frac{1}{2}$.	Col. J. D. Graham.
Sonora, Mex.	150+1.	39.	23.	24. 3.	"

A specimen from California has the rostral rather less developed, and four irregular plates on top of head. The coloration differs in having the light transverse intervals between the dorsal blotches narrower, especially posteriorly.

California.	137+2.	48.	23.	$22\frac{1}{4}$. 4.	Dr. Wm. Gambel.

Genus **PITUOPHIS**, Holbr.

Gen. Char. Body subcylindrical, deeper than wide, attaining often a considerable size. Head elongated, ovoid, in some instances narrow anteriorly. Vertical plate elongated, sometimes as broad anteriorly as long. Superciliaries large, subtriangular. Posterior frontals two pairs, an internal and external, both elongated. Prefrontals subquadrate. A small loral. Postorbitals three or four; anteorbitals generally two, occasionally only one. Temporal shields very small, resembling the scales. Cleft of mouth curved. Dorsal rows of scales 29–35, variable in some species; those on the back carinated, on the sides smooth. Abdominal scutellæ 209–243; posterior large and entire. Subcaudal scutellæ all bifid.

Ground-color whitish or reddish yellow; a triple series of dorsal black blotches, those of the medial series the largest; several series of smaller blotches on the flanks. Abdomen unicolor or maculated, with an outer row of blotches. Head of the same color as the body, maculated with black spots. A narrow band of black across the upper surface between the eyes, and a postocular vitta on each side, extending obliquely from the eye down to the angle of the mouth. A black vertical patch is often seen beneath the eye.

Syn. *Pituophis*, Holbr. N. Amer. Herp. IV, 1842, 7.

Pityophis, Hallow. Proc. Acad. Nat. Sc. Philad. VI, 1852, 181.

Churchillia,* Baird & Girard, Reptiles in *Stansbury's* Expl. of the valley of the Great Salt Lake, 1852, 350.

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* The species upon which the genus *Churchillia* was established, exhibits in the structure of the cephalic plates the remarkable character of having a small median plate in advance of the vertical, limited on each side by the external, and in front by the internal postfrontals. This character, together with the presence of two anteorbitals and four postorbitals, one more on either side than in *Pituophis melanoleucus*, the only species then known, appeared a sufficient generic character. Since the discovery of several other species, in which there are two anteorbitals and four postorbitals, with the structure of the cephalic plates similar to what they

1. Pituophis melanoleucus, Holbr.—Head ovoid, broad behind. Anteorbital 1; postorbitals 3. Dorsal rows of scales 29, the four outer rows smooth, 5th, 6th, and 7th with an obsolete keel. Tail about $\frac{1}{7}$ of total length. Head maculated with black; an oblique vitta from the orbit to the 7th labial. Color of the body whitish, with a dorsal series of very large blotches, the 24th opposite the anus; anteriorly and posteriorly emarginated on the anterior third of the body, oblong posteriorly. Elongated smaller blotches on the flanks, forming three indistinct series, often confluent. Abdomen unicolor. A series of 20–29 distinct blotches along the extremities of the scutellæ.

Syn. *Coluber melanoleucus*, Daud. Hist. Nat. Rept. VI, 1799, 409.—Harl. Journ. Acad. Nat. Sc. Philad. V, 1827, 359; and Med. & Phys. Res. 1835, 122.

Pituophis melanoleucus, Holbr. N. Amer. Herp. IV, 1842, 7. Pl. i.

Pine Snake, or Bull Snake, Bartram, Trav. in Carol., Geo., and Florida, 1791, 276.

Head robust, conical. Vertical plate subpentagonal, broad anteriorly. Occipitals a little larger than the vertical, and as broad anteriorly as long. Internal postfrontals elongated and subtriangular; external postfrontals polygonal. Prefrontals quadrilateral, separated by the rostral. Rostral narrow, very convex, raised above the surface of the snout, and reaching the internal postfrontals. Nasals very large, anterior one the larger. Nostrils vertically oblong, situated in the middle and between both plates. Loral ovoid, small, horizontal. One large anteorbital, with its anterior margin convex, of the same width above as below. Three postorbitals, proportionally large. Temporal shields small, six or nine, or more. Upper labials 8, 7th largest, 4th coming into the orbit. Lower labials 14, 5th and 6th largest, the five posterior ones quite small. Posterior pair of mental shields one-third of the size of the anterior pair, and reaching backwards to opposite the middle of the lower 6th labial. Tail conical and tapering, forming about the seventh of the total length.

The ground-color, when living, is said to be white; as preserved in alcohol it is yellowish brown. The head is maculated with small black spots; frontal bar rather wide; postocular vitta broad. A dor-

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are in *P. melanoleucus*, we deem it expedient to place *Churchillia bellona* in the genus *Pituophis*. One might well have been familiar with the reptiles of North America described before 1851, and not be prepared to identify species presenting the characters just alluded to.

sal series of very large blotches, of a deep chestnut-brown, broadly margined with black anteriorly and posteriorly. These blotches are 24 in number from the head to opposite the anus, and 6 on the tail, where they extend laterally down to the subcaudal scutellæ. More or less confluent, and consequently irregular in shape on the anterior third of the body, they are posteriorly subround or subquadrate, emarginated in front and behind, and separated from each other by a light space embracing four scales, whilst the blotches themselves cover six scales. The flanks are blotched but very irregularly; on the anterior region of the body the blotches elongate in the shape of longitudinal bands or vittæ; on the middle region three indistinct series may be traced, alternating and often confluent by their corners; posteriorly there is only one series opposite to the dorsal, and often confluent with it, so that the corresponding blotches form single patches, extending from the back to the abdomen, and tapering on the sides. The abdomen is dull yellow, with a series of distant blackish brown patches along the extremity of the scutellæ, often extending to the outer row of scales.

Carolina. 216. 60. 29. 55¾. 8. (on dep.) Acad. Nat. Sc.

2. Pituophis bellona. B. & G.—Head elliptical, rather pointed. Vertical plate very broad anteriorly. A second anterior vertical, small, and subcordiform. Anteorbitals 2; postorbitals 4. Dorsal rows of scales 31–35; the seven outer rows smooth. Tail about $\frac{1}{12}$ of total length. Head maculated with black; transverse frontal bar extending from one orbit to the other, well marked; the oblique postocular vitta rather narrow, and reaching the angle of the mouth. Color of the body whitish yellow, sometimes reddish yellow, with a dorsal series of deep black blotches, or of deep brown, margined with black, 51 in number, from the head to the origin of the tail, and a series of smaller spots on each sides. Ten transverse jet-black bars on the tail. Flanks crowded with small and irregular blotches. Abdomen dull yellow, maculated with black blotches more or less crowded.

Syn. *Churchillia bellona*, B. & G. Reptiles in *Stansbury's* Expl. Valley of Great Salt Lake, 1852, 350.

Pituophis affinis, Hallow. Proc. Acad. Nat. Sc. Philad. VI, 1852, 181.

Head broad behind, and well separated from the body by a contracted neck, very much tapering to the end of the snout, subquadrangular from the eyes forwards. Upper surface flattened, snout elevated and rounded. Occipital plates triangular, as broad anteri-

orly as long. Superciliaries longer than either the vertical or occipitals. Vertical subpentagonal very broad anteriorly, as broad as long, and very much tapering posteriorly; its sides concave. The second small subcordiform anterior vertical is situated between the external postfrontals, which are comparatively the larger. Internal postfrontals irregularly triangular, and smaller than the prefrontals, which are irregularly quadrangular. The rostral is proportionally narrow, and raised above the surface of the snout, not reaching, however, the internal postfrontals. Nasals subquadrangular, anterior one a little larger; nostrils situated between the two plates, but more in the posterior one. Loral very small, narrow, and elongated, horizontal in position. Two anteorbitals, inferior one very small; upper one very regular, slightly convex on its anterior margin. Postorbitals four in number, occasionally only three, the two upper ones a little the larger. Numerous small temporal shields. Upper labials 8, 6th and 7th somewhat larger. Lower labials 13, 7th largest; the six posterior ones the smallest. Dorsal scales elliptically elongated, constituting 31–35 rows, the seven outer of which are smooth, the others carinated, the five outermost very sensibly the larger.

The ground-color is whitish yellow: on the anterior third and upper part of the body, the bases, and sometimes the two anterior thirds of the scales are jet black, so as to make the ground-color appear black. There are 51 large chocolate-brown dorsal blotches, margined with jet black from the head to opposite the anus, and 10 on the tail. On the anterior portion of the body these blotches are subcircular, or rather elliptical, covering in width seven or eight rows of scales, and four and two half-scales in length; the spaces between embrace about two scales. Posteriorly the blotches become quadrate, and the intermediate spaces increase so as to be at first equal to the blotches, and towards the origin of the tail they are actually wider by one scale than the blotches themselves. On the tail the blotches assume the shape of narrow transverse bars, tapering downwards. On each side of the dorsal blotches is a series of much smaller and somewhat irregular blotches, margined with black, the blotches being opposite to the light spaces, alternating, but not confluent with the medial blotches. On the anterior third of the body a series of small blotches is observed on the flanks, and beneath it, a series of elongated black patches, all of which exhibit a tendency to become obsolete vertical bars, more apparent posteriorly in very large individuals, giving to the flanks a nebulous appearance. The head

above is yellowish brown, with small black spots on the vertex and occiput. Frontal black bar distinct in small individuals, obsolete in large ones; postorbital vitta narrow; suborbital spot small. Inferior surface of the head and abdomen light straw-color, with an external series of distant black spots on each side, confluent under the tail, and constituting a medial band.

Betw. San Antonio & El Paso.	228. 44. 33.	61 7/8. 5 3/8.	Col. J. D. Graham.
Rio Grande.	231. 53. 33.	61 7/8. 5 3/8.	Gen. S. Churchill.
F't Webster, Santa Rita del Cobre.	225. 63. 31–33.	44 1/8. 6 1/4.	Col. J. D. Graham.
"	225. 63. 31.	39. 5 1/4.	"
Sonora, Mex.	222. 60. 29–31.	23 5/8. 4 1/4.	"
California.	226. 58. 31.	45 7/8. 5 7/8.	Dr. W. Gambel.

3. Pituophis McClellanii, B. & G.—Head subelliptical. Rostral plate very narrow. Anteorbitals 2; postorbitals 4. Dorsal 33–35 rows; the 7 outer rows smooth. Tail forming $\frac{1}{5}$ or $\frac{1}{10}$ of total length. Postocular vitta brown, and rather broad. Suborbital black patch conspicuous; commissure of labials black. Color of body reddish yellow, with a series of 53 blotches from head to origin of tail. Blotches of adjoining series, on either side, confluent across the light spaces between medial blotches. Flanks covered with small blotches, forming 3 or 4 indistinct series. Twelve transverse jet black bars across the tail. Abdomen yellowish, thickly maculated with black patches.

Head proportionally large, ovoid, detached from the body. Snout pointed. Occipital plates small. Vertical broad, subpentagonal, slightly concave on the sides. Superciliaries large. Internal postfrontals rather narrow, elongated, external postfrontals quadrilateral, a little broader forwards. Prefrontals irregularly quadrangular. Rostral very narrow, extending halfway between the prefrontals, convex and raised above the surface of the snout. Nostrils in the middle line between the nasals, the posterior of which is a little the smaller. Loral trapezoidal, proportionally large. Inferior anteorbital very small, resting upon the fourth upper labial. Postorbitals varying in comparative size. Temporal shields small, resembling scales. Upper labials 8, 6th and 7th the larger. Lower labials 12, 6th and 7th largest. Posterior mental shields very small, extending to opposite the junction of the 7th and 8th lower labials. Scales propor-

tionally small, in 33–35 rows, the 7 outer ones perfectly smooth and somewhat larger than the remaining rows.

Ground-color yellowish brown, with three series of dorsal black blotches, 53 in number, from the head to opposite the anus, with 12 on the tail, in the shape of transverse bars. Those of the medial series the larger, and covering 8 or 9 rows of scales. On the anterior part of the body they are subcircular, embracing longitudinally four scales; posteriorly they become shorter by one scale. The light spaces between are a little narrower than the blotches themselves for the twelve anterior blotches, and wider than the blotches for the remaining length of the body. The blotches of the adjoining series alternate with those of the medial series, being opposite to the light intermediate spaces, across which the blotches of either sides are generally united by a transversal narrow band. The flanks are densely covered with small and irregular blotches, forming three indistict series, confluent in vertical bars towards the origin of the tail. Inferior surface of the head yellowish, unicolor. Abdomen dull yellow, with crowded brownish black blotches in series on the extremity of the scutellæ.

Red River, Ark.	231. 52. 35.	$38\frac{1}{4}$. $4\frac{7}{8}$.	Capts. Marcy & McClellan.
"	231. 52. 33.	$24\frac{1}{2}$. $2\frac{7}{8}$.	"

4. Pituophis catenifer, B. & G.—Head subelliptical, flattened above. Vertical plate elongated, nearly equilateral, posterior triangular portion excepted. Rostral broad. Anteorbitals 2; postorbitals 3. Loral trapezoidal, proportionally larger than in other species. Dorsal rows of scales 31; the 4 external rows smooth. Tail forming about $\frac{1}{7}$ of the total length. Frontal black bar conspicuous. Postocular vitta of a jet black, reaching the angle of the mouth between the penultimate and last upper labials. Color of body grayish yellow, the triple series of dorsal black blotches, 61 in number, from the head to the origin of the tail, forming a continuous chain all along the back, owing to the confluence of the lateral series of small blotches with the large medial series, with which they alternate. A series of proportionally large subcircular blotches along the middle of the flanks. Middle of the abdomen unicolor, with an external series of black spots on each side.

Syn. *Coluber catenifer,* Blainv. Nouv. Ann. Mus. Hist. Nat. III, 1834. Pl. xxvi. figs. 2, 2 a, 2 b.

Head subelliptical. Vertical plate maintaining its width posteriorly. Superciliaries proportionally large. Occipitals very much

dilated anteriorly, tapering posteriorly. Prefrontals proportionally small, subcircular. The nasals are nearly equal in size, and the nostrils open between their commissure near the edge of the prefrontals. Rostral proportionally broad, even with the surface of the snout. Loral small, subelliptical and oblique. Two anteorbitals, the upper one very large, the lower one small, resting on the fourth upper labial. Three postorbitals of nearly the same size. The temporal shields, ten to twelve in number, are slightly larger than the contiguous scales. Upper labials 8, 7th the larger. Lower labials 12, 5th and 6th largest. Posterior mental shields very narrow, extending beyond the 6th lower labial. Dorsal scales narrow and rather acute, constituting 31 rows, the outer one of which is considerably the larger. Tail very tapering.

Ground-color above fuscous, with a triple series of black blotches along the back, 78 in number, the 61st opposite to the anus; 17 on the tail. The blotches of the medial series are proportionally very large, quadrangular, longer than broad, covering six rows of scales, and the half of the adjoining rows, embracing longitudinally five or six scales. A narrow light space of one scale exists between each blotch. The adjoining series is composed of much smaller blotches, alternating and covering three rows of scales confluent with the middle ones, thus forming a continuous chain on the back, and enclosing entirely the light spaces between the blotches. A series of subcircular or oblong blotches runs conspicuously along the middle of the flanks, on the 4th, 5th, 6th, and 7th rows of scales. These are 88 in number, the 71st opposite to the anus, and 10 along the anterior half of the tail. The five first blotches are elongated, and exhibit a tendency towards forming a vitta or band. From the middle region of the body to the tail, two obsolete series of very small blotches are seen alternating with the series of the flanks, one above and one below. The abdomen is yellowish, unicolor, except a series of blotches on the extremities of the scutellæ, extending sometimes to the outer row of scales.

San Francisco, Cal. 230. 71. 31. 35. 5⅞. (on dep.) Expl. Exped.

5. Pituophis Wilkesii, B. & G.—Head elongated, conical forwards. Vertical plate pentagonal, much broader anteriorly than posteriorly. Rostral broad. Anteorbitals 2; postorbitals 3. Loral trapezoidal. Dorsal rows of scales 29–31; three outer rows smooth. Tail $\frac{1}{6}$ or $\frac{1}{7}$ of total length. Frontal black bar well marked. Postocular vitta extending over the last upper labial to the angle of the mouth. Color of body whitish yellow on the sides, reddish yellow above, with a dorsal series of subquadrate blotches, 70 in number, from the head to origin of the tail, and proportionally smaller than in any other species. The blotches of the two adjoining series not confluent with those of the medial one.

Head elongated, subelliptical, subpyramidal, or subconical anteriorly. Occipital plates much longer than broad, longer than either the vertical or supereiliaries. Vertical pentagonal, concave laterally, tapering; length greater than the width of its anterior margin. External postfrontals sometimes divided into two plates, one of which has been called upper loral. Internal postfrontals elongated, very narrow posteriorly, sometimes also subdivided. Rostral broad, not separating the prefrontals. Nasals equal in size; nostrils intermediate and nearer to the frontals than labials. Loral not very large. Inferior anteorbitals small, and situated between the 4th and 5th upper labials. Postorbitals nearly equal in size, and generally contiguous to the anterior ones, thus excluding the labials from the orbit, into which, however, the fifth occasionally enters. Temporal shields scarcely to be distinguished from the scales. Upper labials 8 or 9, 4th or 5th occasionally coming into the orbit, penultimate the largest. Lower labials 12 or 13, 5th or 6th the largest, the six posterior ones very much reduced. Dorsal scales elliptical, forming 29–31 rows, the three outer rows perfectly smooth, slight carinæ on the 4th, 5th, and 6th rows, and not very conspicuous on the remaining ones. Tail conical and tapering.

Ground-color yellowish, with a dorsal series of subquadrate blotches, about 90 in number, 20 of which on the tail. These are deep brown, margined with black anteriorly, entirely black posteriorly; these blotches cover transversely 8 or 9 rows of scales, embracing longitudinally five to seven scales on the anterior region of the body, and two or three posteriorly. The spaces between the blotches are of the uniform width of one scale for the whole length of the body, decidedly narrower than in other species. A lateral series of blotches on each side of the medial, covering three rows of scales, and alter-

nating with the medial series. A series of blotches along the middle of the flanks opposite to the blotches of the medial series of the back. On the anterior part of the body the lateral blotches are elongated, and occasionally combine into a band or vitta behind the neck. On the anterior third of the body, an indistinct series of black spots may be seen between the scutellæ and the outer series of lateral blotches. Inferior surface of head and abdomen dull yellowish white, with two series of distant blotches, the outer series more conspicuous than the inner one, and extending to the end of the tail.

In the young the middle region of the abdomen is unicolor, and the external series of spots only exists, which, together with the series on the middle of the flanks, are most conspicuous.

Puget Sound, Or.	215. 56. 29–31. $39\frac{5}{8}$. $5\frac{3}{8}$. (on dep.)	Expl. Exped.
"	209. 72. 29–31. $41\frac{5}{8}$. $7\frac{3}{8}$.	"
Oregon.	209. 66. 29. $14\frac{1}{8}$. $1\frac{1}{4}$.	"
"	213. — 29. $13\frac{1}{4}$. $1\frac{7}{8}$.	"

6. Pituophis annectens, B. & G.—Head elongated, elliptical. Vertical plate subpentagonal, elongated, posteriorly obtuse, with sides concave. Anteorbitals 2; postorbitals 3. Dorsal rows of scales 33, 5 outer rows smooth. Triple series of dorsal blotches confluent for nearly the whole length of the body.

Differs from *P. catenifer* in having much smaller dorsal blotches, and more interspaced. The fifteen anterior blotches of the three dorsal series almost united in a transverse or oblique band, anteriorly and posteriorly irregular. The blotches on the flanks are also proportionally smaller than in *P. catenifer*. From *P. Wilkesii*, which it resembles in the small size of the blotches, it differs by a more conical head, a narrower and longer vertical plate, and a rostral reaching higher up on the snout. The loral and superior anteorbital are quite large, and the lower anteorbital very small. In one specimen we have noticed 5 postorbitals, the 5th contiguous to the lower anteorbital, thus constituting a continuous chain beneath the eye. Dorsal scales in 33 rows, the 5 outermost perfectly smooth.

San Diego, Cal.	243. 71. 33. $28\frac{5}{8}$. $4\frac{13}{16}$.	Dr. J. L. Leconte.

Genus **SCOTOPHIS**, Baird & Girard.

Gen. Char. Form colubrine. Body cylindrical, very long—many individuals attaining a very large size, perhaps the largest of all North American serpents. Head elongated, rather narrow. Vertical plate very broad, sometimes wider than long. Posterior frontals very large. Postorbitals 2; anteorbitals one, generally very large; the longitudinal extension of this and of the postfrontals producing a much elongated muzzle. Mouth deeply cleft, outline nearly straight. Dorsal rows of scales 23–29; those along the back slightly carinated (9–15 rows), on the sides smooth. Abdominal scutellæ from 200 to 235; posterior bifid. Subcaudals all bifid.

Color brown or black, in quadrate blotches on the back and on the sides, separated by lighter intervals. Abdomen usually coarsely blotched with darker. In one species dark stripes on a light ground. Although very large and powerful, many of the species of the genus are characterized by their extreme gentleness, rarely becoming enraged, even when provoked.

1. Scotophis alleghaniensis, B. & G.—Vertical plate longer than broad. Posterior upper labial largest. Outer 7 rows of scales smooth. Dorsal rows 27. Abdominal scutellæ 235. Color black below, mottled anteriorly with white. White edges to some scales, imparting an appearance of dorsal and lateral blotches, especially in the young.

Syn. *Coluber alleghaniensis*, Holbr. N. Amer. Herp. I, 1836, 111. Pl. xx; and 2d. ed. III, 1842, 85. Pl. xix.—Dekay, New York Fauna. Rept. 1842, 36. Pl. xii, fig. 26.

Anterior frontals larger in proportion than in *S. Lindheimerii.* Superciliaries subtriangular. Upper labials 8, increasing behind; posterior the largest. Lower labials 11, 5th and 6th largest, decreasing posteriorly. Nostrils more in the anterior nasal. Outer seven rows of dorsal scales smooth, then an obsolete carination, increasing to the vertebral series. Each scale minutely bipunctate.

General color lustrous pitch-black; beneath, the color posteriorly is uniform slate-black; on the chin and throat dull yellowish: these

two colors, as they extend towards each other, are of less and less extent, mingling in the form of blotches: the anterior fourth shows most of yellowish, the next fourth most of the black, the posterior half uniform black. On separating the scales, those at certain successive intervals on both back and sides will be found to have their bases narrowly margined with white, as if the fundamental color consisted of dark blotches on a white ground, as in *S. Lindheimerii*.

A second specimen, smaller, shows the same characters, but with more of white beneath.

Carlisle, Pa.	234+1. 86. 27.	59½. 10¾.	S. F. Baird.
Unknown.	233+1. 83. 27.	39¾. 7⅛.	Unknown.

2. Scotophis Lindheimerii, B. & G.—Head broader than in *S. alleghaniensis*. Vertical plate as broad anteriorly as long. Posterior upper labials smaller than in *S. alleghaniensis*. Dorsal series 29; abdominal scutellæ 228–235. Black dorsal and lateral blotches; intermediate space rather lighter, with scales edged with white. Scale on sides of neck white, each with bluish spot.

Occipitals moderate, their commissure equal in length to the vertical. Orbits moderate, above the 4th and 5th labials, centre about midway between the snout and angle of the mouth. Anterior orbital large, single, extending nearly to the outer angle of the vertical. Loral trapezoidal, highest anteriorly. Nasals moderate, including nostrils between them. Labials 8 above, moderate, posterior small; 12 below; posterior very small, 6th and 7th largest. Nine rows of scales between labials and abdominal scutellæ at the angle of the mouth. Outer ten rows smooth, then carinated very obsoletely, rather more decidedly and in increasing degree towards the back.

Color above dark lead color, constituted by a dorsal series of quadrangular blotches, about 34 from head to anus, rather acutely emarginate before and behind, occupying a width equal to about 15 scales. The lozenge-shaped intervals between these blotches are from two to three scales long centrally, diminishing and becoming more linear posteriorly. On each side, and alternating with the dorsal series, is a second alternating one, composed of subrectangular elongated blotches, and alternating again with these is a second indistinct series along the edge of the abdomen. The entire system of coloration is very difficult to define, the general appearance being that of a black snake with irregular obsolete mottlings of white.

The intervals between the blotches may be indicated as being white, with the centre and apex of each scale lead color, the proportion of the latter being very small on the sides, and increasing to the dorsal line. The scales in the centres of the blotches have the basal half narrowly margined with white, as is the case, to some extent, with the lateral spots. Beneath greenish white, with the centres of the scutellæ mottled with dark slate-blue, increasing backwards. Chin and throat immaculate yellowish white, scales on the sides with a bluish spot on the apex.

The colors described are those as preserved in alcohol. Probably the color of the animal when alive is much like that of *Bascanion constrictor* or *Scotophis alleghaniensis*.

In the general obsoleteness of the markings, the blotches may sometimes be detected as more or less confluent between the different series.

New Braunfels, Tex. 227+1. 81. 29. 36. 7. Dr. F. Lindheimer.

A second specimen much larger, of what appears to be the same species, differs in having the belly nearly uniform yellowish: the black of the upper parts is replaced by umber-brown. The blotches are visible, but very obsoletely.

Indianola. 234+1. 85. 29. 60. 9. Col. J. D. Graham.

3. Scotophis vulpinus, B. & G.—Head rather short, vertical broader than long. Postfrontals very large, as long as the verticals, penultimate upper labial largest. Dorsal series 25; outer 4 rows smooth. Abdominal scutellæ 203. Subquadrate dorsal blotches transverse, 3 or 4 scales long. Tail tumid.

Anterior frontals much smaller than the posterior. Rostral broad. Occipitals broad, rather short, longer than the vertical. Eyes smaller than in *S. alleghaniensis*, centre over the junction of the 4th and 5th labials. Upper labials 8, penultimate one the largest, last somewhat smaller: lower 10, 6th the largest. Anteriorly the first three or four rows are smooth, there they are very obsoletely carinated, increasing towards the back, although everywhere moderately so. Tail thick.

General aspect that of *Ophibolus eximius*, from which it is however distinguishable by the carinated scales and other generic features. Ground-color above light brown. A series of broad transverse quadrate chocolate blotches extending from head to tail, about 60 in number, 44 to anus. The first spot anteriorly is divided into two on the

nape, and occasionally the blotches anteriorly are irregular, oblique, and varying in size. This occurs, however, only on the anterior fifth of the body, behind which the intervals between the blotches are rectilinear, nearly equal, and about one and a half scales in length. The blotches are generally embraced between the 5th or 6th rows on each side, and are 3 to 4 scales long. The sides of the blotches are not linear but obtuse angled. On each side is a series of smaller rounded blotches on the 3–7th rows, similar in color to those on the back, and like them with a black border, sometimes more or less interrupted. Another series of subquadrate black blotches, about the same size as the last, is visible on the edge of the abdomen, sometimes involving the 1st and 2d rows of scales, these are opposite to the dorsal blotches. Rest of the abdomen yellowish white, with alternating quadrate blotches of black. The brown color becomes lighter on the sides.

Racine, Wisc. 202+1. 68. 25. 32. 7. Dr. P. R. Hoy.

A second much larger specimen from Michigan has the ground-color a yellowish brown, and there is a black streak from the eye to the angle of the mouth; a second vertical stripe under the eye. The spots on the back are only about 45, of which 13 belong to the tail.

This species is probably allied to *C. calligaster* of Say, but no mention is made of the abdominal blotches, and Drs. Holbrook and Hallowell assure us particularly that the scales are smooth.

Grosse Ile, Mich. 202+1. 69. 25. 57. 9. Rev. Chas. Fox.

4. Scotophis confinis, B. & G.—Vertical plate longer than broad. Nostrils more anterior than in *S. vulpinus*. Dorsal rows 25, outer rather larger; exterior 6 rows smooth; abdominal scales 240. Quadrate dorsal blotches elongated throughout, 5–6 scales long.

Head large, broad. Posterior frontals large; anterior considerably smaller; occipitals broad, large. Eye rather large; centre over the line joining the 4th and 5th labials: orbits above the whole of the 4th and 5th labials. Upper labials 8, penultimate the largest, last one large; inferior 12 or 11, posterior small. Nostrils nearly terminal. Rostral narrow, high.

Scales rather short. Outer six rows smooth, remainder very obsoletely carinated. Exterior row rather larger, rest nearly uniform.

General aspect that of *Ophibolus eximius*, from which its larger eyes and head, carinated scales, &c. at once distinguish it. Ground-color ash-gray. A series of 44 dorsal blotches, of which 12 are on the tail. These blotches are dark chocolate-brown, with obsolete black margins. They are included between the 6th and 7th row on each side, and about six scales long. They are very regular in shape, longitudinally quadrate, rather wider transversely in the middle, and with the corners slightly produced longitudinally. The gray intervals are thus not quite rectilinear, rather elliptical, but of the same width throughout. On the 2d, 3d, 4th, and 5th lateral rows is a second series of similar blotches, more or less elongated, especially anteriorly. On the side of the neck, indeed, the blotches are confluent into very narrow distinct stripes. A third series of square blotches on the side of the abdomen, involving the 1st and 2d lateral rows. Rest of belly yellowish white, with black blotches; anterior eighth immaculate. A black stripe from the posterior part of the orbit to the angle of the mouth, which it reaches on the anterior extremity of the last labial. A vertical line beneath the eye, and the edges of the labials in front also black. Some blotching on the top of the head, which is too indistinct to define.

Compared with *S. vulpinus* the eyes are larger, the vertical plate longer, the nostrils more anterior, the carination more obsolete. Body more elongated. Abdominal scutellæ more numerous. Spots longitudinal, not transverse. Scales shorter, broader, more obtusely angular.

This species is closely allied to *S. guttatus*, but is quite distinct. Its full characters can only be seen in larger specimens, which may have been confounded with *S. guttatus*. Very probably some of the numerous synonyms assigned to the latter species may belong here, but in the want of accurate descriptions, the only course left is to give a new name.

Anderson, S. C. 239+1. 81. 25. $16\frac{1}{2}$. $4\frac{3}{4}$. Miss C. Paine.

5. Scotophis laetus, B. & G.—Similar to *S. confinis*, but posterior frontals larger. Vertical plate longer than broad. Dorsal rows 29. Abdominal scutellæ 227. Blotches fewer.

This species bears a close resemblance to *S. confinis*, and its characters may be best given by comparison with the latter. It differs therefore in the greater number of dorsal rows, 29 instead of 25.

The whole body and head are much stouter. Exterior eight rows smooth, rest slightly carinated. The vertical is broad before, rather acute behind. A probably monstrous feature is seen in the union of the two postfrontals, except for a short distance before, and in the loral and postnasal coalescing into one trapezoidal plate. Blotches less numerous. A broad vitta across the back part of the postfrontals, passing backwards and downwards through the eye, and terminating acutely on the posterior upper labial. A blotch across the back part of the vertical, and extending through the occipitals on each side to the nape. The spots are larger, longitudinal throughout, with occasional exceptions.

Its affinities to *S. vulpinus* are close. The vertical, however, is narrow, the eyes much larger, dorsal rows 29 instead of 25. The blotches on the back are longitudinal, and fewer in number. For the full description of this species also, it will be necessary to procure larger specimens.

Red River, Ark. 227. 77. 29. 18. 3¼. Capts. Marcy & M'Clellan.

6. Scotophis guttatus, B. & G.—Head narrow. Dorsal rows 27, outer one scarcely larger; abdominal scutellæ 215–235. A series of quadrate brick-red blotches, intervals lighter. Two light frontlets on the head, margined with black, enclosing a dark red stripe which passes through the eye, across the mouth to the neck.

Syn. *Coluber guttatus*, Linn. Syst. Nat. I, 1766, 385.—Gm. *Linn.* Syst. Nat. ed. xiii, I, iii, 1788, 1110.—Harl. Journ. Acad. Nat. Sc. Philad. V, 1827, 363; and Med. & Phys. Res. 1835, 126.—Schl. Ess. Phys. Serp. Part. descr. 1837, 168.—Holbr. N. Amer. Herp. II, 1838, 109. Pl. xxiv; and 2d ed. III, 1842, 65. Pl. xiv.

Head elongated, outline nearly straight, and transversely tapering from the sides of the occiput to the subtruncate snout. Vertical large, longer than wide, pentagonal, with the lateral margins at a very slight angle with each other. Occipitals rather narrow. Eye moderate; centre rather in advance of junction of 4th and 5th labials; orbit above the whole of these labials. Labials 8 above, penultimate the largest; 11 below.

Body elongated, decidedly compressed to the tip of the tail. Dorsal rows 27. Carination very obsolete, visible only on the 13 central rows, and there very indistinctly; not evident on the tail. Scales

rather large, triangular, pointed. The exterior row little if any larger than the rest.

General color of body above light red, paler on the sides. Along the back a series of dorsal blotches, about 45 in number, 32 from head to anus. These blotches anteriorly are longitudinally quadrate, gradually becoming transverse; in front they are concave before and behind, and with the corners produced longitudinally, exteriorly they are zigzag convex. The color of each blotch is a dark brick-red, with a deep black margin half a scale wide. Exterior to the black is a lighter shade of the ground-color. On each side of the dorsal series is a second alternating one of smaller elongated blotches, similarly constituted as to color. A third opposite to the dorsal, occurs on the edge of the abdomen, and on the 1st to the 4th row of scales: in this the red is lighter, and the black is confined to a few scattered scales. The lateral blotches are more or less indistinct in places, and frequently confluent with each other and the dorsal series. Posteriorly too they are reduced more or less to the black marks in single scales. Color beneath yellowish white, with subquadrangular blotches of black, generally occupying half of the inferior surface of the abdominal scutellæ.

The ground-color of the sides extends up on the forehead in the form of a frontlet, which crosses the vertical at its anterior extremity, passes backwards along the top of the head, including the superciliaries and outside of occipitals, crosses above the angle of the mouth, and runs into the sides of the neck. This is narrowly margined on both edges with black. A second frontlet across the front of the postfrontals, narrower but similar, and bending down on each side to the anteorbital. A similarly colored blotch on the commissure of the occipitals, widening behind and constituting a centre to the dark red space enclosed by the large frontlet on the back of the neck: behind the one just mentioned is another rather larger, and the two are sometimes confluent. A dark red stripe is included between the two frontlets just described, crossing the posterior part of the postfrontals, the upper end of the anterior frontals, and through the eye, across the angle of the mouth down the sides of the neck. Vertical edges of the upper and lower labials black.

Charleston, S. C. 214+1. 79. 27. 29½. 4½. Dr. Barker.

Specimens from Kemper Co., Miss., much larger in size, agree exactly in the pattern of coloration. The red is, however, more or

less effaced, probably by the alcohol. The blotches are light hazel, and the interspaces light chocolate.

Smaller specimens from Georgia differ only in having the blotches dark hazel, lighter centrally. The intervals are ash-gray.

The young sustain a close resemblance to the species described from Anderson, S. C. The scales are scarcely if at all carinated however; the dorsal rows two more: the blotches less regularly quadrate and not elongate posteriorly. The shape of the head and its plates are different. The markings on the head in the latter are reduced to a uniform black band across the postfrontals, passing back through the eye, and ending acutely on the angle of the mouth. The scales also are more carinated.

Kemper Co., Miss.	226+1.	69.	27.	43.	7.	D. C. Lloyd.
"	223+1.	66.	27.	47.	7.	"
Mississippi.	—	—	27	—	—	Dr. B. F. Shumard.
Savannah, Ga.	226+1.	65.	27.	21.	3¼	R. R. Cuyler.
Georgia.	236+1.	—	27.	12.	1⅞.	(on dep.) Prof. Adams.
"	228+1.	—	27.	13§.	2.	"

7. Scotophis quadrivittatus, B. & G.—Shape of head resembling most that of *S. lætus.* Vertical broader anteriorly and more tapering posteriorly. Dorsal rows of scales 27, the five or eight medial rows alone carinated; the carination obsolete. Greenish yellow, with four longitudinal brown bands.

Syn. *Coluber quadrivittatus,* Holbr. N. Amer. Herp. III, 1842, 89. Pl. xx. Chicken Snake, Bartr. Trav. in Carol., Geo. & Florida, 1791, 275.

Body slender, tail very slender, about the fifth of the total length. Head elliptical, quite detached from the body by a slender neck. Eyes large. Vertical plate pentagonal, slightly concave on the sides, equalling in length the commissure of the occipitals. The lower portion of the anterior orbital is narrower than in *S. lætus.* Loral trapezoidal. Two elongated and small temporal shields. Upper labials 8, 7th largest; lower labials 10, 5th largest. Rostral hexagonal. Scales very thin, lozenge-shaped, constituting 27 dorsal rows. Slight traces of carination may be observed on the five or eight medial rows. The outer row is composed of scales as high as long; in the second row they are perceptibly larger than the remaining ones.

Ground-color above greenish yellow, with four longitudinal brown bands, covering each one entire row of scales and the half of the ad-

joining rows. The lateral bands thus extend along the 3d, 4th, and 5th rows, the 4th being the one entirely covered. The dorsal bands extend along the 10th, 11th, and 12th rows, the 11th being entirely covered. The space between the dorsal and lateral band embraces four entire rows of scales, and the half of the adjoining ones. The dorsal space between the dorsal bands comprises three entire rows of scales and the half of the adjoining rows. The abdomen, head and tail beneath are uniformly light straw-color. On the removal of the epidermis the dark bands disappear to a considerable extent, and then indistinct and obsolete quadrate spots become visible on the sides, and probably on the back. The edges of many of the scales are lighter.

Florida. 236+1. 93. 27. $23\frac{1}{2}$. $5\frac{3}{4}$. (on dep.) Prof. Agassiz.

Genus **OPHIBOLUS**, Baird & Girard.

Gen. Char. Body rather thick, tail short. Dorsal rows 21, (in one group 23,) the scales hexagonal, arranged in longitudinal series, broad, short, scarcely overlapping, nearly as high as long, all perfectly smooth and lustrous. Abdominal scutellæ 180–220; posterior entire. Subcaudal all bifid. Head short, depressed, but little wider than the body. Eyes very small. Vertical plate very broad. Postorbitals two, the lower in notch between the 4th and 5th labials. One anteorbital, like the loral, small. Nasals two, with the nostril between them. Upper labials 7.

Ground-color black, brown, or red, crossed by lighter intervals generally bordered by black.

The type of the genus is to be found in *O. Sayi*, to which we would refer for more full generic characters. The red species belong to the genus *Erythrolamprus* of Boie, as understood by Duméril & Bibron.

B. *Dorsal rows* 23.

1. Ophibolus Boylii, B. & G.—Black, with upwards of 30 broad ivory white transverse bands widening on the sides. Dorsal rows of scales 23.

Vertical plate distinctly pentagonal, longer than broad: more elongated than in *O. Sayi*. Sides nearly parallel, a little shorter than the occipital plates. The sides of the head as in *O. Sayi*. Dorsal rows 23, the scales rather more elongated than in *O. Sayi*. Outer row a little larger, all the rest nearly equal. Back and sides black, crossed by about 37 ivory-white bands, the 30th opposite the anus. On the vertebral region these bands are about one and a half scales wide, with the margins parallel to about the 7th outer row of scales, where they begin to widen, so as to embrace from five to seven scales on the outer row. They continue of this width to the middle of the abdomen, where they are either confluent with the white of the opposite side, or are opposite to the black interval on the other side. The black interval between the cross bands is some eight to ten scales

long, narrowing on the sides as the white spaces enlarge, until on the outer dorsal rows it occupies them to four scales, and is continued to the middle of the abdomen; owing to a slight obliquity of the dark patches on the back, their abdominal extensions are very apt to alternate with each other on the middle of the abdomen, instead of being directly opposite and confluent. Every transition from the one condition to the other is observable. The general pattern is thus: a black body, encircled by white rings, which are wider on the sides and beneath. The end of the tail is distinctly annulated. Occasionally some of the black scales on the sides have indistinct white spots in the centres. Labials, plates on the sides of the head, and above in front of the vertical, yellow, with black margins.

El Dorado Co., Cal. 240. 52. 23. 28. 3¼. Dr. C. C. Boyle.

2. Ophibolus splendidus, B. & G.—Black above; the sides black, with a white spot in each scale. The body crossed by broad bands, consisting of white spots, one in each scale. Dorsal rows 23.

Similar in general features to *O. Boylii*. Vertical plate similar to that of *O. Boylii* but broader, and the sides more nearly parallel.

This species forms a connecting link, as to color, between the blotched varieties of *O. Sayi* and *O. getulus*. There is a series of dorsal black blotches from head to tail; in one specimen 63, the 49th opposite the anus; in the other 52, the 41st opposite the anus. These are four or five scales long, and six or seven wide. The lighter intervals between are constituted by one or two transverse rows of spots, each one on a separate scale. The scales on the sides (from the 1st to the 7th or 8th rows) are black, each one with an elongated white blotch in the centre. These blotches occupy nearly the whole scale on the exterior row, but diminish in amount towards the back. A series of rhomboidal darker spots is seen on each side opposite the light intervals, produced by the less amount of white on the scales at that place, and sometimes extend to the abdomen. The abdomen is white, blotched not very deeply with black two or three scales wide, and a continuation of the dark shade in the prolongation of the lateral rhomboids. The blotches of the opposite sides are sometimes confluent and sometimes alternate. In one specimen the black patches are rather wider, extending nearly to the abdomen. Head less blotched with yellow than *O. Boylii*. Differs

from *O. Boylii* in having the light intervals in the form of spots in the centres of dark scales, instead of covering the whole space. The lateral blotches are alternate with those of the back, not continuous and opposite. The blotches are more numerous.

Sonora, Mex.	219. 65. 23.	36. 5½.	Col. J. D. Graham.
"	215. 55. 23.	26. 4.	"

B. *Dorsal rows* 21.

3. Ophibolus Sayi, B. & G.—Black, each scale above with a large circular or yellow spot in the centre. Sometimes only transverse lines of these spots across the back.

Syn. *Herpetodryas getulus*, Schl. Ess. Phys. Serp. Part. descr. II, 1837, 198.
Coronella Sayi, Holbr. (non Schl.) N. Amer. Herp. III, 1842, 99. Pl. xxii.
Coluber Sayi, Dekay, New York Fauna, Rept. 1842, 41.
King Snake.

As already remarked, we consider this as the true type of the genus, and shall accordingly reproduce some of the generic features in more detail.

Body, as in most of the other species, very tense and rigid, with difficulty capable of being extended after immersion in alcohol. Vertical plate triangular, wider than long; outer edge slightly convex, an angle being faintly indicated at the junction of the superciliaries and occipitals; shorter than the occipitals, which are short, longer than broad. Postfrontals large, broad; anterior smaller. Rostral small, not projecting, slightly wedged between prefrontals. Eye very small, orbit about as high as the labial below it; centre of the eye a little anterior to the middle of the commissure, over the junction of the 3d and 4th labials. One anteorbital, vertically quadrate; loral half its height, square. Upper labials 7, increasing to the penultimate. Lower labials 9; 4th and 5th largest.

Scales nearly as high as long, hexagonal, truncated at each end. Dorsal rows 21, exterior rather larger, and diminishing almost imperceptibly to the back, although all the scales in a single oblique row are of very nearly the same shape and size.

The scales on the back and sides are lustrous black, each one with a central elliptical or subcircular spot of ivory-white, which on the sides occupy nearly the whole of the scale, but are smaller towards the back, where they involve one-half to one-third of the length. Beneath yellowish white, with broad distinct blotches of black, more

numerous posteriorly. Skin between the scales brown. The plates on the top and sides of the head have each a yellowish blotch; the labials are yellow, with black at their junction.

Prairie Mer Rouge, La. 216. 52. 21. 42. 5. Jas. Fairie.

Other specimens agree except in having bright yellow instead of white as described; the spots too are rather smaller, and manifest a slight tendency to aggregation on adjacent scales, so as to form transverse bands. This is seen more decidedly where the back is crossed by about 70 short dotted yellow lines; the 56th opposite the anus. The scales between have very obsolete spots of lighter, scarcely discernible. The sides are yellow, with black spots corresponding to the dorsal lines; indeed, there may be indistinctly discerned two or three lateral series of alternating blotches.

Kemper Co., Miss.	211. 52. 21.	47½. 6¼.	D. C. Lloyd.
"	— — —	9½. —	"

In larger specimens from the West, this tendency in the spots to aggregation is still more distinct. The back is crossed by these dotted lines of the number and relation indicated, at intervals of four or five scales; the spots on the intervening space being obsolete. These lines bifurcate at about the 9th outer row, the branches connecting with those contiguous, so as to form hexagons, and these extending towards the abdomen again, decussate on about the third outer row, thus enclosing two series of square dark spots on each side. These lateral markings are, however, not very discernible, owing to the confusion produced by the greater number of yellow spots. On the edge of the abdomen are dark blotches, one opposite each dorsal dark space, the centres of the scutellæ being likewise blotched, but so as rather to alternate with those just mentioned.

Specimens from Indianola exhibit all varieties of coloration.

Red River, Ark.	224. 49. 21.	33¼. 3¾.	Capts. Marcy & McClellan.
Indianola.	213. 50. 21.	39½. 4¾.	Col. J. D. Graham.

4. Ophibolus getulus. B. & G.—Black, crossed by about 30 narrow continuous yellow lines, which bifurcate on the flanks, the very obtuse angles embracing on each side a series of very much elongated patches, and in fact, by the union of the branches with each other, dividing the back into a succession of large black hexagons.

Syn. *Coluber getulus*, Linn. Syst. Nat. I, 1766, 382.—Gm. *Linn.* Syst. Nat. ed. xiii, I, iii, 1788, 1106.—Harl. Journ. Acad. Nat. Sc. Philad. V, 1827, 358; and Med. & Phys. Res. 1835, 122.—Peale, Cont. Macl. Lyc. I, 1829. Pl. v.

Pseudoelaps getulus, Fitz. N. Class. Rept. 1826, 56.

Coronella getula, Holbr. N. Amer. Herp. III. 1842, 95. Pl. xxi.

Anguis annulatus, Catesb. Nat. Hist. Carol. II, 1743, 52. Tab. lii.

Thunder Snake; King Snake; Chain Snake.

Very similar in general relations to *O. Sayi*, although the body appears rather stouter, and the head and eyes somewhat larger in proportion. The color above is deep lustrous black, crossed by about 33 continuous yellow lines, the 26th opposite the anus. These lines, which on the middle of the back are narrow, one-half or one scale in width, widen rapidly till they meet the lateral series of black blotches, when they extend longitudinally in either direction, and anastomose with their fellows. On each side, and alternating with the dark enclosures on the back, is a series of deep black blotches, extending from the abdomen (where those of opposite sides are generally confluent) over the 1st and 2d outer rows of scales. These blotches are rounded above, five or six scales long, and separated from the nearest dark part of the back by one or one-half scale. The outer edge of the abdomen, and the exterior dorsal rows between these blotches being yellow, causes the chain pattern to be continuous, enclosing a series of elongated dorsal spots, from 7 to 10 scales long and about 17 wide. Centre of abdomen largely blotched with black, usually confluent with the blotches already mentioned. The plates on the head are black, with yellow spots.

The pattern as here described is subject to some irregularities, the chain being sometimes broken, and the lines oblique, not transverse, and the dark blotches of opposite sides not truly opposite to each other.

Anderson, S. C.	224. 48. 21.	30½. 4½.	Miss C. Paine.
Charleston, S. C.	213. 52. 21.	47¼. 7¼.	Dr. S. B. Barker.
Mississippi.	— — —	— —	Dr. B. F. Shumard.

5. Ophibolus rhombomaculatus, B. & G.—Light chestnut, with a dorsal series, and two lateral on each side of darker rhomboid blotches. Each blotch with still darker margins.

Syn. *Coronella rhombomaculata*, Holbr. N. Amer. Herp. III, 1842, 103. Pl. xxiii.

Above light chestnut-brown, darker along the back, lighter towards the abdomen. Each scale minutely mottled with darker. Beneath reddish yellow, obscurely blotched with light-brown. A series of 52 dorsal blotches from head to tip of tail, the 42d opposite the anus. These are irregularly and transversely rhomboidal, six or seven scales wide, one and a half to two and a half long, and separated by intervals of about 3 scales, thus wider than the blotches. Their color is darker chestnut, with still darker margins, and sometimes with a faint areola lighter than the ground-color. On each side and alternating with this series, is a second on the 2d to the 6th outer rows, and about a scale long; then a third again alternating on the 1st, 2d, and 3d rows, sometimes involving the edges of the scutellæ. These, though smaller than the dorsal spots, are similar. They are sometimes confluent with each other, though rarely with those of the back. There is a dark stripe from the eye to the angle of the mouth.

Anderson, S. C.	203.	48.	21.	24. $3\frac{8}{9}$.	Miss C. Paine.
Georgia.	200.	44.	21.	$28\frac{3}{9}$. $3\frac{7}{9}$.	Prof. C. B. Adams.

6. Ophibolus eximius, B. & G.—Grayish ash, with one dorsal series of upwards of 50 transversely elliptical chocolate blotches, with two other alternating lateral series on each side.

Syn. *Coluber eximius,* Dekay, (Mss.) and N. York Fauna, Rept. 1842, 38. Pl. xii, fig. 25.—Harl. Journ. Acad. Nat. Sc. Philad. V, 1827, 360; and Med. & Phys. Res. 1835, 123.—Storer, Rep. Rept. Mass. 1839, 227.

Pseudoelaps V, Berth. Abh. K. Ges. Wiss. Gött. I, 1843, 67. Pl. i, fig. 11 & 12.

House Snake, Milk Snake, Chicken Snake, Thunder and Lightning Snake.

Muzzle rather broader, and the head more depressed than in the first described species of the genus: in other respects generally similar, like them having all the scales hexagonal, those on the back scarcely narrower than those on the sides, although rather more elongated than usual. Vertical longer than broad, shorter than the occipitals. General color above yellowish gray, with a dorsal series of large blotches, 55 in number from the head to the tip of the tail, the 45th opposite to the anus. These are transversely elliptical, about four scales long, covering 12 to 15 scales across the back, (more anteriorly than posteriorly,) and separated by intervals of one and a half to two scales, all of nearly the same width. The spots themselves are grayish brown or chocolate, with a broad black border, and

finely mottled internally (as is the ground-color on the sides) with black. The blotches become narrower posteriorly; on the tail their confluence with the lateral series forms black half-rings. On each side, and involving the 2d to the 5th rows, is another series of much smaller and nearly circular blotches, black with the centres brown. These alternate with the dorsal spots. Alternating with the series just described is still another similar to it, but entirely black, on the margin of the abdomen, and on the contiguous spots of the 1st, 2d, and 3d rows. These two lateral series are sometimes confluent. The anterior dorsal blotch is elongated, so as to cover the posterior half of the vertical plate: and in it is a central elongated spot of the ground-color behind the occipitals. A double light spot is seen on the junction of the occipitals, as in *Eutainia*. There are indications of a dark band across the posterior half of the postfrontals, and another from the eye to the angle of the mouth. The labials are edged with black.

The abdomen is yellowish white, with square black blotches, alternating with those already described.

The number and size of these spots varies somewhat in different specimens, though rarely less than 40 from head to anus. The young differ in having the dorsal blotches bright chestnut-red inside of the black margins. The intervals are sometimes white, or clear ash.

Westport, N. Y.	214.	54.	21.	40½.	5½.	S. F. Baird.
Somerville, N. Y.	200.	49.	21.	27.	3¼.	Dr. F. B. Hough.
Warren, Mass.	200.	55.	21.	29.	4½.	S. F. Baird.
Woburn, Mass.	—	—	—	—	—	C. Girard.
Foxburg, Pa.	—	—	—	—	—	S. F. Baird.
Carlisle, Pa.	200.	52.	21.	25.	3½.	"

7. Ophibolus clericus, B. & G.—Similar to *O. eximius*. Body stouter. Head much shorter, centre of eye above the middle of the commissure. Eye much smaller. Body light ash, crossed by less than 40 blotches, which extend to the exterior dorsal row. Only one lateral series of blotches.

Syn. *Coluber eximius*, Holbr. N. Amer. Herp. III, 1842, 69. Pl. xv.

Similar in general appearance to *O. eximius*, but readily distinguishable by prominent characters. The head and mouth are very short,

the centre of the eye being in the centre of the commissure, not anterior to it. The vertical is as broad as long, and the occipitals are but little longer than broad. The superciliaries are very short to correspond with the minute eye. All these plates are shorter than in the corresponding size of *O. eximius*. The scales on the body are much wider in proportion, and on the sides, where they are arranged more in quincunx, owing to the less amount of truncation. Entire body much stouter than in the allied species.

The body is crossed by a series of 38 dorsal blotches, the 29th opposite the anus. They are much broader and larger than in *O. eximius*, and extend between the outer dorsal rows. These blotches are chocolate, lighter on the sides, and distinctly bordered with black; they are about five or six scales long. The intervals between the blotches are mottled ash, or pepper and salt. On each side is a second alternating series of black blotches, much smaller than the dorsal, and extending from the exterior dorsal row on the edge of the abdominal scutellæ. Beneath yellowish white, with distinct quadrate black blotches. The stripe from the eye to the angle of the mouth as in *O. eximius*.

The body, viewed from above, appears encircled by a series of black rings in pairs, enclosing a third of an ash-color. The tints as usual are darker on the back.

Clark Co., Va.	*199.	49.	21.	36. 6¾.	Dr. C. B. Kennerly.
Mississippi.	—	—	—	— —	Dr. B. F. Shumard.

8. Ophibolus doliatus, B. & G.—Red, encircled by about 22 pairs of narrow black rings, each enclosing a yellow unspotted ring. Head red, with the first ring of the anterior pair crossing the ends of the occipitals.

Syn. *Coluber doliatus*, Linn. Syst. Nat. I, 1766, 379.—Gm. *Linn.* Syst. Nat. ed. xiii, I, iii, 1788, 1096.—Harl. Journ. Acad. Nat. Sc. Philad. V, 1827, 362; and Med. & Phys. Res. 1835, 125.

Coronella coccinea, Schl. Ess. Phys. Serp. Part. descr. II, 1837, 67. Pl. ii, fig. 11.

Coronella doliata, Holbr. N. Amer. Herp. III, 1842, 105. Pl. xxiv.

Head rather more depressed than in the species of the other section. The lower postocular, which is smaller than the upper, rests in a notch between the 4th and 5th upper labials, lying longitudinally against the latter. In many other species the contact is not so intimate.

Color above yellowish white; in life, bright red. The body is encircled by 24 pairs of black rings, (the 19th opposite the anus,) each pair enclosing a yellow ring between them. Along the back the black and yellow rings are nearly of equal width, the three covering a length on the back of five or six scales. Anteriorly their intervals are 8 or 9 scales long, posteriorly somewhat less. The black rings, as they descend on the sides, separate somewhat, so as to leave an interval of about three scales; they are also somewhat narrower than above. On the abdomen they are generally interrupted, the corresponding ends of the same ring sometimes meeting, and sometimes alternating. Occasionally there are scattered black blotches on the belly between the pairs. The anterior black ring of the first pair crosses the posterior part of the occipitals, extending across between the angles of the mouth. The head in front of this is red, with a small black ring in the posterior half of the vertical. The posterior edges of the labials are black.

In a second smaller specimen from Mississippi, there are 17 pairs of rings to the anus, and 4 on the tail. The whole head is black, the first yellow interval beginning just back of the occipitals.

Not having a specimen of *O. doliatus* from the Atlantic States, we are in some uncertainty as to whether this be really the above species, especially as it differs somewhat from Dr. Holbrook's description.

Kemper Co., Miss.	208. 49. 21.	$18\frac{3}{8}$.	$2\frac{5}{8}$.	D. C. Lloyd.
Mississippi.	188. 50. 21.	$8\frac{1}{2}$.	$1\frac{1}{4}$.	Dr. B. F. Shumard.

9. Ophibolus gentilis, B. & G.—Muzzle more convex and acute than in *O. doliatus*. Body brownish red, encircled by about 25 pairs of broad black rings enclosing a yellow ring: the yellow mottled with black on the sides. Black rings broader than in *O. doliatus*. Upper part of head entirely black.

Ground-color dull red, encircled by 25 pairs of black rings, the 21st opposite the anus, each pair enclosing a third ring of yellowish white. The black rings are conspicuously broader above, the three crossing eight scales on the vertebral row anteriorly, and towards the anus about five. Anteriorly the intervals between successive pairs consist of about five scales, posteriorly only of two or three, thus diminishing considerably. The black rings contract as they descend, those of each pair receding slightly from each other, so as to cause the yellow portion to expand about one scale. The black rings are

continuous on the abdomen, those of contiguous pairs (not of the same pair) sometimes with their intervening spaces black. The scales in the white rings are always more or less mottled with black, especially along the sides of the body, this mottling being very rarely observable on the red portion. The anterior black ring of the first pair is extended so as to cover the whole head above, except the very tip; the yellow ring behind it involves the extreme tip of the occipitals.

A larger specimen is much duskier in its colors. The black rings extend on the back so that the contiguous rings of adjacent pairs run into each other. There are 28 pairs of rings, the 25th opposite the anus.

In a specimen from Prairie Mer Rouge, which probably belongs to this species, there are but 21 pairs of rings, the 19th opposite the anus. The rings separate more on the sides than in the other specimens, the intervals covering some six or eight scales. The black rings are mostly interrupted below; the interrupted ends of contiguous rings of adjacent pairs connected by short black blotches. The white rings are mottled, and the head is black as described.

Red River, Ark.	♀	198.	45.	21.	20.	2¾.	Capts. Marcy & McClellan.
"		201.	—	21.	27½.	—	"
?Prairie Mer Rouge, La.		184.	45.	21.	16½.	2¼.	Jas. Fairie.

Genus **GEORGIA**, Baird & Girard.

Gen. Char. Vertical plate short, very broad. Superciliaries broad, and the cornea scarcely visible from above. Head rather high. Outline of the top of the head very convex. Two postorbitals; one large anteorbital. Two nasals, very short. Rostral broad, low. Dorsal rows of scales perfectly smooth, in 17 rows, overlapping or imbricated. Postabdominal scutella entire. Postfrontals much larger than the prefrontals. Size of the animal very large. Color black.

This genus has a strong resemblance to *Bascanion*, from which it differs by its stouter form, much broader vertical, one anteorbital, undivided postabdomidal scutella, &c. From *Ophibolus* it is distinguished by the broader superciliaries, deeper head, much imbricated scales, &c.

1. Georgia Couperi, B. & G.—Postorbitals resting on the 4th labial. Black above, dark slate beneath. No red marks evident on the abdomen.

Syn. *Coluber Couperi*, Holbr. N. Amer. Herp. III, 1842, 75. Pl. xvi.

Vertical plate pentagonal, as broad as long. Much shorter than the occipitals. Width of head greater than half its length. Eye rather small, its centre above the junction of the 4th and 5th labials, and anterior to the middle of the commissure. Inferior postorbital resting on the 4th labial. Loral quadrangular. Labials 7 above, increasing in size to the 4th; the 5th small, triangular, and having the 4th and 6th in contact above it; 6th very large; 7th scarcely smaller. Color intense lustrous black, the bases of the scutellæ clouded with lead-color. Plates on the inferior surface of the head with the centres brownish yellow.

Specimen described belonging to the Academy of Natural Sciences.

Altamaha, Ga. 184. 60. 17. 60. 11. Dr. J. E. Holbrook.

Genus **BASCANION**, Baird & Girard.

Gen. Char. Body slender, elongated. Tail very long. Head narrow, deep, long. Eyes very large. Postorbitals 2; anterior 2, upper very large, lower very small, in a notch between the 2d and 3d labials. Fourth labial produced up behind the eye to meet the lower postorbital. Loral one; nasals two. Vertical much elongated and narrow, concave externally. Dorsal rows of scales 17, all perfectly smooth, and subhexagonal. Abdominal scutellæ 170–200; posterior one divided: subcaudal 90–110, all bifid. Colors black or olive. Uniform above; lighter below: skin between the scales black. Young blotched.

1. Bascanion constrictor, B. & G.—Vertical diminishing for half its length, then parallel. Centre of eye over the 4th labial. In the adult, color lustrous pitch-black, above and beneath greenish black, sometimes tinged with greenish white. Chin and throat white. The young are olive, with rhomboidal dorsal blotches; beneath greenish white.

Syn. *Coluber constrictor*, Linn. Syst. Nat. I, 1766, 385.—Gm. *Linn.* Syst. Nat. ed. xiii, I, iii, 1788, 1109.—Harl. Journ. Acad. Nat. Sc. Philad. V, 1827, 348; and Med. & Phys. Res. 1835, 112.—Schl. Ess. Phys. Serp. Part. descr. 1837, 133. Pl. v, figs. 3 & 4.—Storer, Rep. Rept. Mass. 1839, 225.—Holbr. N. Amer. Herp. III, 1842, 55. Pl. xi.—Thomps. Hist. of Verm. 1842, 117.—Dekay, New York Fauna, Rept. 1842, 35. Pl. x, fig. 20.

Hicrophis constrictor, Bonap. Fn. Ital. II, 1841. Art. *Col. leopard.*

Vipera niger, Catesb. Nat. Hist. Carol. II, 1743, 48. Tab. xlviii.

Black Snake, Kalm, Reise N. Amer. II, 1764, 202.—Penn. Arct. Zool. Suppl. II, 1792, 92.

Vertical plate much longer than broad, pentagonal, anterior margin convex, the lateral strongly concave, the plate rapidly diminishing to half its length, thence nearly parallel, terminated by a rather obtuse angle; a little shorter than the occipitals. Superciliaries large, rather broad. Rostral rather broad and high, wedged to a slight extent between the prefrontals. Eye large, its centre before the middle of the commissure, and over the 4th labial. The lower

anteorbital very small, wedged in between the upper anteorbital, the loral, the 3d labial, and the eye. Loral trapezoidal, oblique, moderate. Labials above 7; the 1st, 3d, and 5th smaller than the rest, the 3d and 4th entering into the orbit; the 4th the only one in contact with the lower postorbital; 6th and 7th largest. Lower labials 8, the 5th much the largest. Two rows of temporal scales between the labials and occipitals. Exterior row of dorsal scales very large, diminishing gradually on the back. Scales very thin, the posterior angle moderately truncate, so as to give an elongated hexagonal shape to the exposed portion. Exposed surface of exterior row nearly as high as long.

Color above uniform lustrous pitch-black, beneath slate-color, sometimes tinged with greenish white. Lower jaw and chin, and sometimes edge of the upper labials white. Specimens from the South and South-west, as preserved in alcohol, are apt to exhibit an olive-green tinge, sometimes a dark blue, and occasionally the whole under surface has a decided greenish white color. In one or two specimens there is but one anteorbital.

Carlisle, Pa.	178+1.	93.	17.	40¼. 10⅝.	S. F. Baird.
"	189+1.	95.	17.	50. 12¼.	"
"	184+1.	95.	17.	58. 13.	"
"	178+1.	95.	17.	37⅞. 10.	"
Anderson, S. C	179+1.	—	17.	41. —	Miss C. Paine.
"	185+1.	90.	17.	47⅛. 12¼.	"
Kemper Co., Miss.	175+1.	—	17.	30. 6⅜.	D. C. Lloyd.
"	181+1.	—	17.	43¼. 11⅜.	"
Mississippi.	181+1.	110.	17.	33. 10.	Col. B. C. L. Wailes.
Prairie Mer Rouge, La.	183+1.	—	17.	28⅜. —	Jas. Fairie.

As is usually the case, the young of this species are variegated in color instead of being uniform. The ground-color is dark olive, with a succession of darker rhomboidal dorsal blotches from head to tail. These are about nine scales wide, and four or five long, separated by lighter intervals, which, narrow along the back, widen of course rapidly towards the abdomen. The edge of each scale is obsoletely lighter than the centre, the dark centres in some scales being of such intensity as to produce the impression of distinct spots, especially on the sides. Along the vertebral region, the margins of the blotches are narrowly darker, and those of the intervals lighter than on the

sides. Beneath greenish white, each scutella with from two to four dark spots on the edges. Top of head yellowish gray, posterior margins of both pairs of frontals dark chestnut, as are the contiguous edges of the superciliaries and vertical, and posterior edges of the superciliaries and occipitals as well as a small blotch on the outer edge of the superciliaries, and a broad patch in the centre of the occipitals running up into the vertical. Sides of head white, especially labials and orbitals; tinged with bluish behind the eyes, and spotted with dark brown.

Specimens over 18 inches lose the blotching, and become more and more uniform, although to a considerable size showing traces of the spots on the abdominal scutellæ.

Carlisle, Pa.	183+1. 91. 17.	21. $5\frac{1}{4}$.	S. F. Baird.
"	186+1. 83. 17.	$15\frac{5}{8}$. $3\frac{5}{8}$.	"
"	183+1. 91. 17.	21. $5\frac{1}{4}$.	"
Anne Arundel Co., Md.	184+1. 94. 17.	$14\frac{1}{4}$. $3\frac{1}{2}$.	J. H. Clark.
Anderson, S. C.	180+1. 100. 17.	$21\frac{1}{4}$. $5\frac{5}{8}$.	Miss C. Paine.
"	177+1. 93. 17.	$21\frac{3}{4}$. $5\frac{3}{8}$.	"
Charleston, S. C.	177+1. 105. 17.	$21\frac{1}{8}$. $5\frac{3}{8}$.	Dr. S. B. Barker.

2. Bascanion Fremontii, B. & G.—Black, and similar to *B. constrictor*, but stouter. Scales behind the head broader, those on the back, narrower. Tip only of the lower jaw white.

The single specimen in our possession of this species is too much mutilated to allow of an accurate diagnosis of its character. By comparison with a large number of specimens of *Bascanion constrictor*, its distinction is sufficiently evident. For the reasons given, however, it will be necessary to make the description comparative with that of *B. constrictor*. The body is stouter. The scales back of the head a good deal broader, while those on the back generally are more elongated and less truncate. The head is larger in all its dimensions. The color appears to be intense black, tinged with slate on the belly. Head entirely black, except the end of the lower jaw, which is white. The specimen was collected in California by Col. J. C. Fremont, to whom we dedicate the species.

California.	183+1. — 17.	55. $12\frac{3}{4}$.	Col. J. C. Fremont.

3. Bascanion Foxii, B. & G.—Body and head thicker than *B. constrictor*. Tail shorter. Scales broader, the two outer rows having their exposed surface higher than long. No adult procured. Immature specimen brownish olive tinged with blue: a series of transverse blotches on the back. Sides spotted.

This species is, in all probability, the young of one which when adult is entirely black, and as such confounded with the true *B. constrictor*. Its primary differences, when compared with individuals of the same size of the latter species, are to be seen in the much greater thickness of the head and body and shorter tail, this accompanied by much wider scales on the back and abdomen. The vertical plate is rather broader behind. There are two lorals, one above the other, this probably not constant. The labials are higher. The scales are all broader; the two exterior rows having their exposed parts higher than long. The posterior part of the body and tail more truly cylindrical than on the other species. Color above brownish olive, tinged with blue on the sides, each scale with a deeper shade of brown towards the tip. A series of very obsolete darker transverse blotches along the back. Beneath greenish white, with darker blotches on the sides of the abdomen. A specimen from Pittsburgh, Pa., probably belonging to this species, has three postorbitals and a single loral. It has also 19 dorsal rows, but agrees in all the other characters.

Grosse Isle, Mich.	183+2. 79. 17. 22. 5.	Rev. Chas. Fox.
Pittsburgh, Pa.	177+1. 85. 19. 15. 3½.	B. A. Fahnestock.

4. Bascanion flaviventris, B. & G.—Above dark olive-green, beneath yellow. Scattered spots of black on the sides and beneath. Head across superciliaries narrower than distance from snout to end of occipitals. Lower postorbital in contact only with the 4th labial.

Syn. *Coluber flaviventris*, Say, in *Long's* Exped. Rock. Mts. II, 1823, 185.

General characteristics of the head as in *Bascanion constrictor*, the differences being difficult to express by description. Head narrow, elongated. Greatest width on superciliaries less than half the length of plated part of head. The lower anteorbital is included between the 2d and 3d labials, the upper orbital and the eye, only touching the

loral by one corner. Lower postorbital in contact only with the 4th labial, the 5th scarcely touching it by its corner. The scales are scarcely as much elongated as in *B. constrictor*.

Above light olive-green, posteriorly tinged somewhat with reddish. Beneath bright greenish yellow, rather lighter on the tail, this color involving the lower half of the labials. The skin between the scales, but slightly extensible, is black. On the sides the scales are obscurely margined with greenish yellow, and many of them have each a single spot of black, generally near the tip. The abdominal scutellæ are also sparsely spotted in a similar manner. The spots are sometimes wanting.

A specimen from California differs in having the vertical broader.

Betw. Indianola & San Antonio.	167+1. 90. 17.	35. 10.	Col. J. D. Graham.
"	169+1. 95. 17.	29. 7½.	"
California.	188+1. 91. 17.	34. 8½.	Dr. W. Gambel.

5. Bascanion vetustus, B. & G.—Stouter than *B. flaviventris*. Breadth of head across superciliaries equal to half the interval between tip of rostral and posterior end of occipitals. Lower postorbital in notch between the 4th and 5th labials. Olive-brown above, greenish white beneath.

Head broader and shorter than in *B. flaviventris*. Vertical rather shorter, broader behind. Superciliaries and frontals much broader. Centre of eye scarcely in advance of the centre of commissure. Profile more rounded in front. Above olive, tinged with brown; beneath greenish white, no black dots visible. There appears to be little if any black in the skin between the scales, although the basal edges of the scales themselves are slightly tinged.

San Jose, Cal.	171+2. — 17.	34. —	Dr. J. L. Le Conte.
Puget's Sound.	171+1. 89. 17.	30½. 8. (on dep.)	Expl. Exped.
"	164+2. 90. 17.	19. 5½.	"
"	166+3. 79. 17.	29. 7.	"
Oregon.	165+1. — 17.	28. —	"

Genus **MASTICOPHIS**, Baird & Girard.

Gen. Char. Similar in general features to *Bascanion*, but still more slender and elongated. Tail very long. The head is almost as deep as broad, and the vertical plate very narrow and long. The most striking feature of difference is seen in the prolongation upwards of the 5th posterior labial instead of the 4th, to meet the lower postorbital. Superciliaries very broad and projecting, more so in proportion to the vertical than in *Bascanion*. Rostral quite small. Eyes very large. Postorbitals 2; lower resting on the upward extension of the 5th labial, not touched by the 6th. Anteorbitals 2; upper very large, lower very small, in a notch between the 3d and 4th labials. One loral and two nasals, with the nostril intermediate. Scales all very smooth. Dorsal rows 17 or 15. Abdominal scutellæ 200–210; posterior divided. Subcaudal 95–150, all divided. Abdomen blotched, seldom unicolor. Marking anteriorly and posteriorly apt to be different. The true type of this genus is to be seen in *M. ornatus*, B. & G.

A. *Dorsal rows* 17. *Tail* ¼ *length of body.*

1. Masticophis flagelliformis, B. & G.—Color black anteriorly, lighter posteriorly. Scales, when lighter, with darker margins.

Syn. *Anguis flagelliformis*, Catesb. Nat. Hist. Carol. II, 1743: 54. Tab. liv.
Coluber flagellum, Shaw. Gen. Zol. III, 1802. 475.
Coluber flagelliformis, Holbr. N. Amer. Herp. I, 1836, 107. Pl. xix.
Psammophis flagelliformis, Holbr. N. Amer. Herp. 2d ed. III, 1842, 11. Pl. ii.
Coach-whip Snake, Bartr. Trav. in Carol., Georgia, and Florida, 1791, 219.

Vertical plate wide in front, rapidly tapering, until at the anterior third it is less than half as wide as in front, thence the sides are parallel, acutely pointed behind. Superciliaries very broad, projecting. Occipitals as long as the vertical. Postfrontals large, anterior smaller. Eye large, its centre considerably in advance of

the middle of the commissure, and over the junction of the 4th and 5th labials. Upper orbital very large, extending far forwards above, its upper angle reaching the angle of the vertical. Loral rather large, higher than long. Nasals moderate. Upper labials 8; the 6th subtriangular, and smaller; the 7th and 8th largest of all, elongated, equal. Lower labials 9, the 5th largest.

Body very slender and attenuated. Dorsal rows of scales 17, all smooth, elongated, even the exterior row longer than broad.

Color anteriorly, above and on the sides black, this distinct for one-fourth of the length, fading gradually into brown, which becomes lighter and lighter towards the tail. Behind the black portion, the scales above are brownish yellow at their basal margin, the rest of the scale more or less mottled with the different shades of brown. The darkest tint is usually seen near the tip of the scales, this on the tail forming a distinct margin. Beneath, the color is yellowish white, on the anterior fifth so much blotched with purplish brown as to be nearly uniform, posterior to which it disappears almost entirely, being represented only by occasional dashes. The ends of each scutella, however, on their margins, exhibit the reddish brown blotches, and are colored much like the sides of the body at that place. The centres of all the plates beneath and on the sides of the head are yellow. Anteorbital mostly yellow.

S. Carolina. 202+2. 96. 17. 44. 10½. Dr. W. J. Burnett.

2. Masticophis flavigularis, B. & G.—Light dull yellow, tinged with brown above. Beneath, two longitudinal series of blotches distinct anteriorly. In alcohol, and especially when the epidermis is removed, the whole animal appears of a soiled white.

Syn. *Psammophis flavigularis*, Hallow. Proc. Acad. Nat. Sc. Philad. VI, 1852, 178.

Size very large. Vertical plate broad before, tapering to the middle, where it is about half as wide as anteriorly, thence it runs nearly parallel. Vertical rather shorter than occipitals. Greatest breadth across superciliaries less than half the length of the portion covered by plates. Occipitals moderate. Centre of eye considerably anterior to the centre of commissure; over the junction of the 4th and 5th labials. Labials 8 above, increasing in size to the 5th, which is elongated vertically, the 7th elongate and largest. The 5th forms part of the inferior and posterior wall of the orbit, as in all the species of the genus, resting above against the lower postorbital, with which

the 6th labial is not in contact. Dorsal scales broader than in *Bascanion constrictor*, their sides perfectly straight, slightly truncate, with the corners rounded. Exterior row largest, rest gradually diminishing. Scales on the tail widely truncate.

The general color, both above and below, may be described as a dull straw-yellow, tinged with light olivaceous brown above. This latter tint exists in the form of a shading on the centres and towards the tips of the scales, leaving the bases yellowish. The proportion of brown increases towards the back, and in older specimens sometimes suppresses the yellow. In all instances a darker shade is seen towards the tip of each scale. The skin between the scales is yellowish. The scutellæ anteriorly exhibit each two rather large brownish blotches, one on each side of the median line, constituting two rows on the abdomen, which fade out posteriorly. Sometimes the series are not discernible, the blotches spreading so as to constitute a dark shade to the margins and exterior edges of the scutellæ. The posterior portions of the plates under, and on the sides of the head, are similarly blotched; the same tendency being observable on the posterior edges of the plates on the top of the head, by the deeper shade of the olivaceous brown there prevalent. Anteorbitals yellow.

Betw. San Antonio & El Paso.	193+2.	100.	17.	57¾. 17½.	Col. J. D. Graham.
"	196+1.	100.	17.	65½. 15½.	"
New Braunfels, Tex.	196+2.	94.	17.	69½. 15½.	F. Lindheimer.
Red River. Ark. ♂	191+2.	—	17.	57½. —	Capts. Marcy & McClellan.

In smaller specimens the blotching beneath is rather more decided. In addition to the colors described, the back is crossed by indistinct bars of darker, eight or nine scales wide and half a scale long. This color is also seen on the skin between the scales under the dark bars, where the bases of the scales themselves are darker instead of light. There is a tendency towards stripes on the side: first one of light brown, on the outer edge of the abdomen; then an interrupted yellow one at the junction of the abdominal scutellæ and outer scales; then brown again through the centres of the rows. This, however, is not very conspicuous. Sometimes the dark shades on the sides are tinged with reddish. The obsolete transverse bars are seen at intervals of one or two scales.

Betw. Indianola & San Antonio.	197+2.	96.	17.	41½.	10.	Col. J. D. Graham.
Indianola.	194+2.	110.	17.	40.	10½.	"
"	197+2.	110.	17.	34¾.	9.	"

A specimen from Fort Webster or Copper Mines shows the stripes on the sides much more distinctly, running through all the dorsal rows anteriorly, and crossed by the indistinct bars already referred to. The contrast between the dark chestnut-brown spots on each side, and its deeper centre, with the clear yellow of the edges, is very distinct. Beneath yellow, with the blotches reduced to mere dull spots.

Santa Rita del Cobre 211+2. 101. 17. 39½. 10⅝. Col. J. D. Graham.

3. Masticophis mormon, B. & G.—Head rather short. Vertical plate with anterior and posterior ends nearly equal, concave between. Pale yellowish red, tinged with gray anteriorly. A series of transverse blotches across the back.

Syn. *Coluber mormon,* B. & G. Reptiles in *Stansbury's* Expl. of Valley of Great Salt Lake, 1852, 351.

The only specimen of this species in our possession is immature. Although belonging to a different genus, it is somewhat similar to the young of *B. constrictor,* though lighter. The occipitals and commissure of the mouth are, however, much shorter, the vertical and occipital nearly equal in length. Vertical, with the sides concave; dimensions anteriorly and posteriorly nearly equal. Scales not quite so broad as in *Bascanion Foxii,* though broader than in *B. constrictor,* especially on the anterior row. Above pale yellowish red, more grayish anteriorly. A series of transverse blotches from head to tail, as in *Bascanion constrictor,* though rather less distinct. Beneath yellowish, unspotted except on the outer edges. Stouter in its dimensions than the young of *Bascanion constrictor.*

Owing to the immaturity of the specimen, we have felt in doubt whether it should be referred to *Bascanion* or to *Masticophis.* The fact of the 5th labial being in contact with the lower postorbital has rather decided us in favor of the latter.

Great Salt Lake, Utah. 178+1. 100. 17. 13¾. 3½. Capt. H. Stansbury.

B. *Dorsal rows* 15. *Tail about* $\frac{1}{3}$ *the total length.*

4. Masticophis ornatus, B. & G.—Excessively elongated. Above very deep purple, brighter on the sides. Beneath mottled. A yellow stripe on each side of the abdomen, and two pairs of short yellow stripes, one behind the other, on the anterior part of the body, and in the 4th dorsal rows.

In this form the peculiar characters are carried to their maximum of development, and the species should be considered as the true type of the genus. The head is narrow, much elongated, and rather depressed; being considerably less arched than in *M. flagelliformis.* The vertical is very much elongated, a little shorter than the occipital. The muzzle is rather broad anteriorly, owing to the greater than usual development of the anterior frontals. The centre of the eye is considerably in advance of the commissural line, and behind the junction of the fourth and fifth labial. The upper anteorbital is very large, the lower still smaller than in the other species; in one specimen it is wanting. The sixth labial scarcely touches the postorbital; in one specimen being separated by a small plate. The loral is elongated, lower than in *M. flagelliformis.* Labials 8 above, penultimate largest; 9 or 10 below, the fifth largest. Rostral broader than high, the reverse being the case in *M. flagelliformis.* Dorsal rows of scales 15. The scales are broad, very large, thin, and perfectly smooth. The edges are nearly straight, tip truncated and rounded off. They are decidedly broader than in *M. flagelliformis.*

General color above dark purple, becoming almost black towards the back, brighter on the sides. The colors are deeper towards the head. Skin between the scales dark. Beneath yellowish, blotched with black. Anteriorly the blotches are in the form of two quite contiguous rows of broad mottled spots, which become broken posteriorly, and overspread the abdomen. Anteriorly these are dark brown, posteriorly they are lighter, and tinged with red. The tail is immaculated, reddish white. A distinct yellow line is seen along the outer edge of the scutellæ involving the lower edge of the exterior row of scales, and through the five exterior rows of purplish scales run stripes of darker; the bases of the scales being yellow. A very striking mark is to be seen in two pairs of short yellow stripes on each side, one pair commencing opposite to the 10th scutella, and running back about six scales; the second about opposite the 29th scutella, and running back about 10 or 12 scales. The mark is on

the fourth row and adjacent edges of the 3d and 5th. It is not entirely yellow, but has a light reddish stripe through its centre. There are faint indications of a repetition of these marks of similar character farther behind, but the specimens do not show them distinctly.

Betw. Indianola & El Paso.	203+2. 149. 15.	65½. 22.	Col. J. D. Graham.
"	204+2. 152. 15.	65. 22.	"

5. Masticophis tæniatus, B. & G.—A broad brown dorsal stripe margined by a darker line. The four outer rows of scales on each side yellow, with a dark line through the centre of each. A dark line along the edge of the abdomen, making six dark lines on each side. Beneath yellowish.

Syn. *Leptophis tæniata,* Hallow. Proc. Acad. Nat. Sc. Philad. VI, 1852, 181.

Owing to the mutilation of the head of the single specimen in our possession, it is impossible to describe this with any degree of accuracy; in its general relations, however, it has the plates much as in the preceding species.

A longitudinal dorsal band, six and two half-scales wide, olive-brown, each scale with a rather deeper spot in the centre; the four and a half scales on each side of this band yellow, each row with a narrow brown stripe through its centre, fading out in the tail. There are thus five dark stripes on each side, the fifth above margining the dorsal band. Of these stripes, the 1st and 3d are narrow, each showing a stripe of yellow of the same size on each side of it; the 2d and 3d are closer to each other and broader. Beneath yellowish, with a distinct dark stripe on each side, just within the external row of dorsal scales. The scutellæ otherwise immaculated, except a few scattered dots towards the head, exhibiting a tendency to arrangement in two rows. Extreme bases of all the scales black.

California.	209+2. 157. 15.	48½. 14.	Dr. W. Gambel.

Genus **SALVADORA**, Baird & Girard.

Gen. Char. Head elliptical, detached from the body by a contracted neck. Snout protruding. Cephalic plates normal. Edges of rostral free. Two nasals. One loral. Two, occasionally three anteorbitals and two postorbitals. Temporal shields small, scalelike. Eyes quite large. Two pairs of mental scutellæ. Tail slender. Body covered with smooth scales. Postabdominal scutella bifid. Subcaudal all bifid. Color diversified, in longitudinal bands.

Salvadora Grahamiæ, B. & G.—A dorsal ochraceous band or vitta, on each side of which a black one of the same width. Flanks yellowish green. Abdomen uniform dull yellow. Dorsal scales in 17 rows.

Head conical, rostral plate very prominent, with edges free, appearing as if fastened on the outside of the snout after all the others had taken their place. Prefrontals proportionally large, forming the upper edge of the nostrils, and widely separated, for the two anterior thirds of their length, by the rostral. Postfrontals but slightly larger than the prefrontals, like the latter, subrounded, longitudinally narrow, transversely elongated, and produced slightly between the postnasal and the loral, on the sides of the head. Vertical subpentagonal, much elongated, tapering posteriorly without being pointed. Occipitals elongated, posteriorly truncated, sides rounded. Prenasal larger, subtrapezoidal; postnasal subquadrangular; nostril situated at the antero-posterior angle of the postnasal. Loral subtriangular, base in an horizontal line with the head; apex upwards produced between the postfrontal and the upper anteorbital. Upper anteorbital large, angular, produced to the upper surface of the head between the superciliaries and postfrontals. Inferior anteorbitals small and quadrangular, lowest situated on the commissure between the 4th and 5th labials. Postorbitals angular, equal in size. Two pretemporals, shields somewhat larger than rest, which are scarcely larger than the scales. Mouth deeply cleft, undulating. Upper

labials 9; 7th largest, the 4 anterior ones comparatively small. Lower labials not conspicuous, 10 in number, 5th largest, the three posterior ones scarcely to be distinguished from the scales. Posterior pair of mental scutellæ much smaller than the anterior, extending to the middle of the fifth inferior labial.

Body subcylindrical, elongated, tail subconical, tapering, forming about the $\frac{1}{4}$ of the total length. Scales elliptical, disposed in 17 rows; outer row somewhat broader, the rest slightly diminishing towards the dorsal region.

Surface of head brown. An ochraceous vitta extends from the occiput to near the end of the tail, embracing anteriorly three rows of scales, and posteriorly one row, and two adjoining halves to opposite the anus; on the tail it covers two half scales. On each side of this a black vitta runs parallel, and covers the same number of scales anteriorly and posteriorly, except on the tail, where it is narrower, and embraces only half a scale. The antero-inferior margin of the scales in the black vitta is yellowish green. The remaining portion of the flanks, embracing four rows of scales, and the extremities of the scutellæ, is uniform yellowish green, with the bases of the scales blackish, as is also the skin. The abdomen is uniform dull yellow.

Sonora, Mex. 180+1. 97. 17. $28\frac{1}{2}$. $7\frac{1}{2}$. Col. J. D. Graham.

Genus **LEPTOPHIS**, Bell.

Gen. Char. Head conical, very much swollen on the temporal region, separated from the body by a very small neck, and tapering considerably on the snout, which is protruding. Cephalic plates normal. One nasal plate. One loral. One anteorbital and two postorbitals. Eyes large. Cleft of mouth deep and curved. Tail slender and very long, forming more than $\frac{1}{3}$ of the total length. Scales in 17 rows, carinated, except the first and second rows, which are smooth. Postabdominal scutellæ bifid. Subcaudal all bifid. Unicolor.

Syn. *Leptophis*, Bell, in Zool. Journ. II, 1826, 328.

1. Leptophis æstivus, Holbr.—Body reddish green above; yellowish white beneath. Dorsal scales in 17 rows.

Syn. *Coluber æstivus*, Linn. Syst. Nat. I, 1766, 387.—Gm. *Linn.* Syst. Nat. ed. xiii, I, iii, 1788, 1114.—Harl. Journ. Acad. Nat. Sc. Philad. V, 1827, 357; and Med. & Phys. Res. 1835, 121.

Leptophis æstivus, Bell, Zool. Journ. II, 1826, 329.—Holbr. N. Amer. Herp. III, 1842, 17. Pl. iii.

Anguis viridis, Catesb. Nat. Hist. Carol. II, 1743, 57. Pl. lvii.

Green Snake, Bartr. Trav. in Carol., Geo. and Flo., 1791, 16.

Head regularly ovoidal. Vertical plate elongated, subpentagonal, diminishing posteriorly, though not acute. Occipitals elongated, tapering posteriorly, and subtruncated. Frontals subrounded; prefrontals smaller than postfrontals by about one-fourth. Rostral rounded, broader than high. Nostril in the middle of the nasal. Loral subtrapezoidal. Anteorbital angular, much broader above than below. Postorbitals subangular, lower one the smallest. Superciliary well developed, irregularly oblong. A large pretemporal shield, and three or four smaller ones. Upper labials 7; 6th slightly the largest. Lower labials 8; 5th the largest. Posterior mental scutellæ slender and elongated, extending beyond the 5th lower labial.

Scales subelliptically elongated, strongly carinated except the outer row, which is perfectly smooth, and the 2d row, which is but slightly carinated. These two external rows are broader than the rest, especially the outermost.

Anderson, S. C.	157+1. 130. 17.	25½. 9⅝.	Miss C. Paine.
"	154+1. 134. 17.	24. 9⅜.	"
Kemper Co., Miss.	154+1. 128. 17.	27¾. 10⅞.	D. C. Lloyd.
"	154+1. 129. 17.	25. 10.	"
Virginia.	154+1. 126. 17.	33½. 8⅝.	
Anne Ar. Co., Md.	155+1. 135. 17.	21¾. 8½.	J. H. Clark.

2. Leptophis majalis, B. & G.—Reddish green above, yellowish white beneath. Body proportionally stouter and tail shorter than in *L. æstivus*. Snout and whole head, including vertical, longer than in latter species. Dorsal scales in 17 rows.

Head more pointed, broader on the temporal region, and more tapering on the snout than in *L. æstivus*. Vertical plate subhexagonal, broader, and postfrontals proportionally larger in comparison with the prefrontals, than in *L. æstivus*. Occipitals maintaining more their width posteriorly, obtuse-angled behind. Nasal more elongated; loral smaller, and longer than high. Two large temporal shields and a few small ones behind. Scales strongly carinated, except the outer row which is perfectly smooth, and the second row, which is but slightly carinated. The scales of both of these rows are broader than the rest.

Indianola, Tex.	163+1. 111. 17.	29⅝. 10.	Col. J. D. Graham.
"	156+1. 113. 17.	28¼. 10⅛.	"
Red River, Ark.	163+1. 111. 17.	28½. 9¾.	Capts. Marcy & McClellan.
New Braunfels, Tex.	154+1. 115. 17.	23⅜. 8¾.	F. Lindheimer.

Genus **CHLOROSOMA**, Wagl.

Gen. Char. Head elongated, ovoidal, separated from the body by a slender neck. Snout protruding. Cephalic plates normal. One nasal plate, with the nostril in the centre. One loral. One anteorbital; two postorbitals. Eyes very large. Mouth deeply cleft. Tail slender, between $\frac{1}{3}$ and $\frac{1}{4}$ of total length. Scales all perfectly smooth. Postabdominal scutella bifid. Subcaudal all bifid. Unicolor.

Syn. *Chlorosoma*, Wagl. Nat. Syst. der Amph. 1830, 185.

Chlorosoma vernalis, B. & G.—Uniform green, darker above, lighter beneath. Dorsal scales in 15 rows.

Syn. *Coluber vernalis*, Dekay, Mss.—Harl. Journ. Acad. Nat. Sc. Philad. V, 1827, 361; and Med. & Phys. Res. 1835, 124.—Storer, Rep. Rept. Mass. 1839, 224.—Holbr. N. Amer. Herp. III, 1842, 79. Pl. xvii.—Dekay, N. York Fauna. Rept. 1842, 40. Pl. xi, fig. 22.—Thomps. Hist. of Verm. 1842, 117.

Green Snake.

Head proportionally long, ovoidal, slightly swollen on the temporal region. Snout rounded and projecting considerably over the lower jaw. The rostral plate shows but little from above. Outlines of frontals rounded, prefrontals proportionally large, and more than half the size of the postfrontals. Vertical hexagonal, elongated, posteriorly more tapering than anteriorly; sides slightly concave. Occipitals large, subangular. Superciliaries quite large, broader posteriorly than anteriorly. Postorbitals two, subquadrangular; lower one resting on the commissure of the 4th and 5th upper labials. Anteorbital angular above, rounded below, with anterior margin convex. Loral angular, longer than high, and proportionally well developed. Nasal elliptically elongated, with nostril in the middle. Three temporal shields, well developed; anterior one elongated, largest. Cleft of mouth curved or undulated. Upper labials 7;

4th largest; 5th and 6th nearly equal to the 4th; 3d and 4th beneath the eye, forming the inferior part of the orbit. Lower labials 8; 5th largest; the three anterior and three posterior ones quite small. Posterior pair of mental scutellæ longer and slenderer than the anterior pair, extending much beyond the 5th lower labial.

Body elongated, subcylindrical, a little deeper than broad, covered with smooth subhexagonal or subelliptical scales, constituting 15 longitudinal rows, the outer row broader than the rest, which diminish towards the middle line of the back. The tail is very much tapering, pointed, and forming about $\frac{1}{3}$ or $\frac{1}{4}$ of the total length. Dark green above, lighter on the flanks; yellowish white beneath.

Westport, N. Y. ♀	138+1.	79.	15.	18.	5¼.	S. F. Baird.
"	137+1.	74.	15.	17.	5.	"
"	132+1.	94.	15.	17½.	6¼.	"
Lebanon Sp., N. Y.	—	—	15.	15.	5½.	Wm. B. Parker.
"	—	—	15.	15.	6.	"
Carlisle, Pa.	130+2.	92.	15.	18⅞.	6⅞.	S. F. Baird.
"	130+1.	—	15.	11½.	4.	"
Racine, Wisc.	128+1.	85.	15.	12⅛.	4⅛.	Dr. P. R. Hoy.
Portland, Me.	—	—	15.	19½.	5½.	Prof. Caldwell.
"	—	—	15.	18.	5½.	"
Cambridge, Mass.	138+1.	79.	15.	18⅝.	5½.	J. H. Richard.
"	—	—	15.	6⅜.	1⅛.	C. Girard.
? ? *Mississippi.*	138+1.	69.	15.	20½.	—	Dr. B. F. Shumard.

Genus **CONTIA**, Baird & Girard.

Gen. Char. Head ovoidal, and with the body much depressed, rather short, with the snout truncated. Cephalic plates normal. One nasal. Nostril in its middle. One loral. One anterior and one postorbital. Eye small. Mouth moderately cleft. Scales smooth. Postabdominal scutella bifid. Subcaudal all divided.

Contia mitis, B. & G.—Deep chestnut-brown above, with two longitudinal light bands, one on each side of the back, below which is a series of black dots. Scales minutely dotted with black. Anterior half of the scutellæ black; posterior half light yellow. Dorsal scales in 15 rows.

Head almost as deep as the body, snout protruding over the lower jaw, and obliquely truncated. Vertical plate hexagonal, sides nearly parallel, posteriorly very acute. Occipitals elongated, truncated posteriorly, slightly convex exteriorly. Postfrontals large and angular. Prefrontals subangular, much smaller. Rostral well developed, broad, but slightly produced between the prefrontals. Nasal quadrangular, longer than high, with nostril in the middle, a little nearer the anterior than posterior edge of the plate. Loral elongated and quadrangular, situated above the 2d labial. Anteorbital angular and elevated, situated above the 3d labial. Postorbital angular, larger than the anteorbital, situated above the commissure between the 4th and 5th labials. Superciliaries proportionally small and oblong. A large and angular elongated temporal shield. Upper labials 7; anterior and posterior ones smaller; 3d and 4th beneath the eye; lower labials 7, 4th largest. Posterior pair of mental scutellæ very small. Two scutellæ on each side, along the 5th, 6th, and 7th infralabials.

Body slender, subcyliudrical, broader than deep. Scales proportionally large, subelliptical, posteriorly rounded or subtruncated. Those of the exterior row conspicuously broader. Tail short, conical, and tapering.

The lighter bands of the back cover the 4th exterior row of dorsal scales; the series of black dots is immediately beneath on the 3d row of scales. Tip of scales of exterior row black. Head above blackish brown, beneath mottled with black, on a yellowish green ground. The abdomen is regularly and transversely barred with black and light yellow.

San Jose, Cal.	167+1.	31.	15.	$12\frac{5}{8}$.	$1\frac{9}{16}$. Dr. John L. Leconte.
California.	—	—	—	4.	$\frac{6}{8}$. (on dep.) Expl. Exped.
Oregon.	154+1.	35.	15.	8.	$1\frac{5}{16}$. Dr. Avery J. Skilton.

Genus **DIADOPHIS**, Baird & Girard.

Gen. Char. Head subelliptical, elongated, depressed, distinct from the body. Cephalic plates normal. Two postorbitals, and two anteorbitals. A well-developed loral. Two nasals; nostril between. Eyes large. Mouth deeply cleft. Body slender, subcylindrical; tail tapering. Scales smooth, disposed in 15 or 17 rows. Postabdominal scutella bifid. Subcaudal all divided. Unicolor above, and generally with a light ring on the occipital region. Abdomen lighter, unicolor, or punctate.

A. *An occipital ring. Eye above the 4th and 5th upper labials. Dorsal scales in 15 rows.*

1. Diadophis punctatus, B. & G.—A yellowish white occipital ring. Body bluish black above; yellowish orange beneath, with a medial series of spots, sometimes absent. Tail beneath unicolor. Dorsal scales in 15 rows.

Syn. *Coluber punctatus*, Linn. Syst. Nat. I, 1776, 376.—Gm. *Linn.* Syst. Nat. ed. xiii, I, iii, 1788, 1089.—Harl. Journ. Acad. Nat. Sc. Philad. V, 1827, 354; and Med. & Phys. Res. 1835, 117.—Storer, Rep. Rept. Mass. 1839, 225.—Holbr. N. Amer. Herp. 2d ed. III, 1842, 81. Pl. xviii.
Spiletes punctatus, Swains. Nat. Hist. of Fish. Amph. & Rept. II, 1839, 364.
Calamaria punctata, Schl. Ess. Phys. Serp. Part. descr. 1837, 39.
Ring-necked Snake.

Head very much depressed, flattened above; snout rounded, and overlapping the lower jaw. Vertical plate subpentagonal, tapering backwards, posteriorly acute. Occipitals large, elongated, subangular. Prefrontals irregularly rounded, posterior pair twice the size of the anterior. Rostral broad, but low. Nasal plates large, nostril intermediate. Loral quadrilateral. Two anteorbitals, inferior one narrow and the smaller. Superciliary well developed, broader posteriorly than anteriorly. Two postorbitals, inferior one very small, situated above the junction of the 5th and 6th upper labials. Temporal shields conspicuous, anterior one larger and elongated. Upper

labials 8; 7th the largest, 4th and 5th forming the lower part of the orbit. Lower labials 8; 5th the largest. Two pairs of mental scutellæ, extremity of the posterior pair extending beyond the 5th lower labial.

Body slender, subcylindrical; tail tapering. Scales subelliptical; outer row but slightly larger. Occipital ring of the width of two scales, sometimes narrower. Upper labials yellowish, like the lower jaw and inferior surface of head and abdomen. A series of dark subtriangular spots along the lateral margins of the scutellæ, and in contact with the dark color of the flanks. Abdomen either unicolor or provided with series of similar dark spots along its middle region, from the anterior third of the body to near the anus. The spots sometimes elongate transversely in the shape of bars across the abdomen.

Carlisle, Pa.	148+1.	53.	15.	13⅜.	3.		S. F. Baird.
"	158+1.	50.	15.	13.	2¾.		"
"	158+1.	52.	15.	14.	3.		"
"	148+1.	44.	15.	11¼.	2⅛.		"
Foxburg, Pa.	161+1.	56.	15.	14⅛.	3⅜.		"
Pittsburgh, Pa.	159+1.	50.	15.	15⅝.	3⅛.		"
French Creek, Pa.	157+2.	36.	15.	13¼.	2⅛.		"
Lebanon Sp., N. Y.	—	—	15.	5.	1⅛.		Wm. B. Parker.
Georgia.	141+1.	48.	15.	10¼.	2⅜.		Maj. J. Le Conte.
Riceboro, Ga.	145+1.	36.	15.	10.	1¾.		Dr. W. L. Jones.

A specimen from Anderson, S. C., exhibits a somewhat slenderer head, and a narrower and more elongated vertical plate.

Anderson, S. C.	155+1.	44.	15.	14½.	2½.		Miss C. Paine.

Another very young specimen from Mississippi has a shorter head, and a vertical plate proportionally much broader and shorter.

Mississippi.	—	—	15.	5.	1⅛.		Dr. B. F. Shumard.

B. *An occipital ring. Eye above the 3d and 4th labials. Dorsal scales in* 15 *rows.*

2. Diadophis amabilis, B. & G.—Body above deep blackish brown; beneath yellowish white, with crowded small black spots. Occipital ring narrow. Dorsal scales in 15 rows.

Head, body, and tail very slender; head flattened above; body subcylindrical; tail subconical and tapering into a point. Vertical

plate subpentagonal, less tapering posteriorly than in *D. punctatus*, and subacute. Occipitals narrow and elongated. Frontals as in *D. punctatus*. Superciliaries narrower, and nearly of the same width throughout their length. Upper labials 7; 6th largest. Lower labials 8; 5th largest. Scales rather short, subelliptical, considerably larger on the sides than on the back, especially the outer row. Color of the abdomen extending to the outer row of scales, the posterior portion of which alone is black. Numerous small spots are scattered all over the lower part of the body, from the head to near the end of the tail. The upper surface and sides of head, as well as the labials of both jaws and chin, are blackish brown. The abdomen, in life, is in all probabilities purplish, judging of it from traces of that color left beneath the tail of one of the specimens preserved in alcohol.

San Jose, Cal.	182+1. 59. 15.	$12\frac{1}{2}$. $2\frac{9}{16}$.	Dr. J. L. Leconte.
"	— — 15.	$9\frac{1}{2}$. 2.	"

3. Diadophis docilis, B. & G.—Body above uniform ash-gray; yellowish white beneath, spotted with black. A proportionally broad yellowish white occipital ring, margined with a narrow black line. Dorsal scales in 15 rows.

Head narrower than in *D. amabilis*. Vertical plate subpentagonal, elongated, sides nearly parallel to the point where it enters between the occipitals. Prefrontals and eyes proportionally much smaller than in *D. amabilis*. Body very slender, covered with proportionally large scales. Head above blackish brown. Upper labials and head beneath yellowish, mottled with black. Occipital ring yellowish white, covering the length of three scales. The anterior black margin passes to the black spots along the labials. Small black spots are irregularly scattered all over the abdomen; they form one series on each side, along the exterior and posterior margin of the scutellæ, to the tip of the tail. All the scales are uniform ash-gray, but when examined closely they appear punctured with minute black dots. The bases of the scales are black when stretched apart. The tail beneath is almost unicolor, exhibiting but very few dots.

R. San Pedro of R. Grande, or Devil's River.	193+1. 57. 15.	$11\frac{7}{8}$. $2\frac{1}{8}$.	Col. J. D. Graham.

4. Diadophis pulchellus, B. & G.—Body above greenish brown, the scales minutely dotted with black. Beneath deep orange-red, with small black spots irregularly scattered all over, from head to near the end of tail. Occipital ring broad, margined anteriorly and posteriorly with a narrow black line. Dorsal scales in 15 rows.

Head small, body proportionally long and subcylindrical; tail conical, and very much tapering. The vertical plate is subpentagonal, and still less tapering, and less acute than in the preceding species. Superciliaries as in *D. amabilis.* Scales subelliptical, elongated. Outer rows larger than the rest, which diminish towards the dorsal line. The bright color of the abdomen extends to the two external rows of scales, which are unicolor, the spots of the abdomen scarcely passing beyond the scutellæ, although a series of very small spots may be followed along the upper edge of the 2d dorsal rows of scales close to the color of the back. The upper labial and lower jaw are yellowish white.

El Dorado Co., Cal. 203+1. 60. 15. $14\frac{3}{4}$. $2\frac{5}{8}$. Dr. C. C. Boyle.

C. *No occipital ring. Eye above the 3d and 4th labials. Dorsal scales in 17 rows.*

5. Diadophis regalis, B. & G.—Body above uniform greenish ash; beneath light yellow, scattered all over with small black spots. No occipital ring. Dorsal scales in 17 rows.

Head proportionally short and broad behind; head less depressed than in the preceding species, though flattened above; snout rounded. Eyes very small. Vertical plate subpentagonal, tapering posteriorly. Superciliaries narrower anteriorly. Body long and subcylindrical. Scales proportionally large and elongated, in 17 rows; those of the outer row conspicuously broader. The upper and lower jaws and inferior surface of head maculated with black, on a light ground. Color of the abdomen extending to the outer row of scales, which are dotted with black posteriorly. The black spots on the abdomen extend considerably beyond the anus.

Sonora, Mex. 237+1. 58. 17. $22\frac{3}{4}$. $3\frac{1}{8}$. Col. J. D. Graham.

Genus **LODIA**, Baird & Girard.

Gen. Char. Head ovoidal, distinct from the body. Two vertical plates; a small anterior one being situated between the postfrontals immediately in advance of the vertical proper. Two nasals. Loral entering into the orbit; above it one anteorbital. Postorbitals two. Superciliaries elongated and well developed. Mental scutellæ one pair. Eyes proportionally large, circular. Scales smooth. Post-abdominal scutella bifid. Subcaudal, all in pairs.

Lodia tenuis, B. & G.—Body dull brown above, bluish on the sides, with a longitudinal lighter stripe on each flank. Abdomen lighter; bases of scutellæ bluish. Tail beneath unicolor, with an external series of bluish spots. Dorsal scales in 15 rows.

Syn. *Calamaria tenuis*, B. & G. Proc. Acad. Nat. Sc. Philad. VI, 1852, 176.

Vertical plate hexagonal, as broad anteriorly as posteriorly. Anterior vertical ovoidal or subelliptical, intermediate between the postfrontals, which are angular and extend to the sides of the head. Prefrontals subtriangular, about half the size of postfrontals. Rostral broad and well developed. Occipitals subangular externally, proportionally large and elongated. Nasals large, nostrils in the middle, between both plates. Loral large, polygonal, elongated, situated above the commissure of the 2d and 3d upper labials, entering into the orbit as an inferior anteorbital. A quadrangular superior anteorbital, enclosed between the postfrontal, superciliary, and loral. Two angular postorbitals, inferior one resting on the commissure of the 4th and 5th labials. Superciliaries oblong. Temporal shields conspicuous, anterior one elongated and largest. Mouth deeply cleft. Upper labials 6; the three posterior ones a little larger than the three anterior. Lower labials 6; 4th largest. Mental scutellæ one pair. Body slender, subcylindrical; tail short, conical, and tapering. Scales proportionally large, rhomboidal, smooth, forming 15 dorsal rows; outer row but slightly broader than the rest.

Puget Sound, Or. 150+1. 33. 15. 8¾. 1¼. (on dep.) Expl. Exped.

Genus **SONORA**, Baird & Girard.

Gen. Char. Head continuous with the body, very much narrower on the snout. Cephalic plates normal. Vertical plate narrow anteriorly. Superciliaries proportionally large. One loral. One anteorbital and three postorbitals. Two nasals. Eyes proportionally large. Scales smooth. Postabdominal scutella bifid. Subcaudal, divided.

Sonora semiannulata, B. & G.—Body above annulated with jet black; tail completely annulated; intermediate space wider, orange-red on the dorsal region, greenish on the sides, with bases of scales blackish. Dorsal scales in 15 rows.

Snout subquadrangular, elongated. Vertical plate widening posteriorly to the occipitals. Occipitals elongated, margin irregular. Postfrontals angular, not reaching the orbit. Prefrontals trapezoidal, two-thirds of the size of the postfrontals. Rostral very much developed. Nostrils in the middle, between the two nasals. Loral elongated, horizontal, angular. Eyes circular. Superciliaries angular, lozenge-shaped. Anteorbital one, subcrescentic, narrow, resting on the third upper labial. Postorbitals three, angular, upper one largest, produced between the superciliaries and occipitals, and touching slightly the vertical. Three temporal shields, anterior one largest, and angular. Mouth deeply cleft, undulated. Upper labials 7; nearly equal in size; first and last smallest. Inferior labials 8; 4th largest. Body subcylindrical, covered with smooth scales, proportionally broad, and forming 15 rows, outer row but slightly broader. Tail tapering to a point.

Body above crossed with transverse jet-black bars, 25 from head to anus, extending between and involving the exterior rows, becoming narrower on the flanks: along the back 3 to 4 scales long. Space between the bars above orange-red, one scale wider than the black bars; on the sides greenish, with the base of the scales blackish. On the tail 6 black rings, continuous all around, covering 2 to 3 scales; intermediate space red-orange, 4 or 5 scales wide. Beneath uniform dull green, the black bars of the body not touching the scutellæ.

Sonora, Mex. 149+1. 39. 15. $9\frac{1}{2}$. $1\frac{3}{4}$. Col. J. D. Graham.

Genus **RHINOSTOMA**, Fitz.

Gen. Char. Head small, subconical, pointed, continuous with the body. Rostral large, prominent. Two pairs of frontal plates. Vertical cordiform. One nasal; nostril in the middle. One loral. One anterior and two postorbitals. Superciliaries very small. Eyes small, over the 3d upper labial. Mouth small. Scales smooth, in 19 rows. Postabdominal scutella entire. Subcaudal scutellæ bifid.

Syn. *Rhinostoma*, Fitz. N. Class. Rept. 1826, 29.

Rhinostoma coccinea, Holbr.—Body yellowish red (said to be crimson in life), crossed by pairs of black rings, enclosing each a yellow one.

Syn. *Coluber coccineus*, Blum. in *Licht.* and *Voigt*, Magaz. V, 1788. Pl. v. —Gm. *Linn.* Syst. Nat. ed. xiii, I, iii, 1788, 1097.—Harl. Journ. Acad. Nat. Sc. Philad. V, 1827, 356; and Med. & Phys. Res. 1835, 119.

Heterodon coccineus, Schl. Ess. Phys. Serp. Part. descr. 1837, 102. Pl. iii, figs. 15 and 16.

Rhinostoma coccinea, Holbr. N. Amer. Herp. III, 1842, 125. Pl. xxx. Scarlet Snake.

Body slender, cylindrical, tense, and rigid. Dorsal scales rhomboidal, rather elongated. Vertical plate very large, cordiform or subhexagonal, almost as broad anteriorly as long; obtuse angled before, acute angled behind; the two outer sides short, parallel. Occipitals large, a little longer than the vertical. Postfrontals large; prefrontals much smaller. Rostral projecting forwards, acute, causing the snout to be pointed, not recurved nor compressed into a ridge as in *Heterodon*. Eye small, its centre over the 3d labial, and over the middle of the commissure. Postorbitals two; anteorbital one. The superciliaries are very small and narrow, in one specimen looking like an upper postorbital. One line of temporal shields. Loral small. One nasal; nostril situated in its centre, with a rounded groove to the lower edge, sometimes to the upper, apparently separating two nasals. Upper labials 6, the 3d constituting the greater portion of the orbit

below, with the lower postorbital resting upon it: all the labials nearly equal in size; 4th and 5th largest. Lower labials 8, 5th largest.

The back and sides are embraced by about 20 elongated longitudinal black rings (the 16th opposite the anus), their anterior and posterior sides on the dorsal line, their lateral resting on the outer dorsal row. Across the back the black is well defined and continuous, about two scales long; on the sides, however (from the 1st to the 3d rows), the black is interrupted more or less, sometimes reduced to a few scattered scales. The intervals between the successive rings are yellow, with the centres of the scales dusky (they sometimes have only a narrow margin of yellowish), and on the sides may be seen a distinct rhomboidal black spot opposite each dorsal light interval. This is sometimes broken up, and confused with the black of the rings on the sides. The large spaces enclosed by the rings themselves are yellowish red (said to be crimson in life), six to nine scales long, and about thirteen wide: they are variable in length, being larger at about the anterior third than elsewhere. Beneath uniform yellowish white. The first ring crosses just behind the occipital plates, and in front of it is a narrow black band crossing the middle of the occipitals, from one angle of the mouth to the other, sometimes connected with the first ring by a narrow black line. Rest of the head yellowish. Another specimen has 26 rings, the 20th opposite the anus.

Anderson, S. C.	169. 35. 19.	$17\frac{1}{2}$. 2.	Miss C. Paine.
Riceboro, Ga.	166. 45. 19.	$18\frac{7}{5}$. $2\frac{3}{4}$.	Dr. W. L. Jones.
Mississippi.	— — —	— —	Dr. B. F. Shumard.

A specimen from Prairie Mer Rouge has the whole lower wall of the orbit constituted by the 3d labial, with both anterior and posterior orbitals resting upon it. The vertical is more elongated. The anterior dorsal ring, instead of being continuous, is divided anteriorly, and the ends, after approximating, are bent back on the occipitals, and extend to the eye. The snout, too, seems rather more pointed.

Prairie Mer Rouge, La.	166. 36. 19.	$13\frac{3}{4}$. $2\frac{1}{4}$.	Jas. Fairie.

Genus **RHINOCHEILUS**, Baird & Girard.

Gen. Char. Head subelliptical, pointed on the snout, and separated from the body by a contracted neck. Rostral plate large, but not prominent above. Two pairs of frontal plates. Vertical hexagonal. Two nasals; nostrils intermediate. One loral. One anterior and two postorbitals. Superciliaries large. Eyes also large, over the 4th and 5th upper labial. Mouth large. Scales smooth, in 23 rows. Postabdominal scutella entire. Subcaudal scutellæ all undivided.

Rhinocheilus Lecontei, B. & G.—A dorsal series of quadrate black blotches, with the intermediate spaces of the same size, and pale red. Flanks variegated with yellowish and black; beneath lighter, unicolor.

Head distinct from the body; broad behind, nearly flat above. Vertical plate hexagonal, elongated, largest anteriorly, the lateral edges tapering, and constituting the longest sides of the figure. Superciliaries quite large. Occipitals subangular, proportionally small. Prefrontals large compared to the postfrontals. Rostral prominent forwards, rounded beneath, tapering upwards. Eyes large, over the junction of the 4th and 5th upper labials, about opposite the middle of the commissure. Postorbitals two, lower in notch between the 5th and 6th labials, although resting more on the latter. Anteorbital large, resting on the 4th labial, the 4th and 5th labials constituting equally the inferior part of the orbit. Loral elongated, horizontal, trapezoidal, well developed. Nasals apparently double, perhaps a single one very much excavated. Two temporal shields between the occipitals and labials. Labials 8 above, 7th largest; 8 below, 5th largest. Dorsal rows of scales 23, all perfectly smooth; scales rhomboidal, nearly equal, but rather narrow above. Abdominal scutellæ 206; posterior one entire. Subcaudal scutellæ 40, all entire.

The body is crossed by about 33 quadrate black blotches, the 27th opposite the anus. These are nearly of the same length, and of the same distance apart throughout, four scales long, and extending between the second external rows, where their sides are rather rounded or angulated. The black is very deep, and continuous on the four or five central rows of scales, whence to the flanks it is varied by having the centres of each scale reddish yellow. The intervals between the blotches are exactly the reverse; above they are uniform pale red, and on the sides the centres of each scale are black. Sometimes scattered black scales may be observed on the back in the light spaces. Beneath yellowish white, unspotted. The two outer rows of scales of the same color, but with a short black bar extending from the middle of each light and dark space, perpendicularly to the abdomen, the extreme edge of which is sometimes involved. The head and half its length behind are black, spotted with yellowish on the sides. The snout and labials yellowish, the plates margined with black.

San Diego, Cal. 206. 40. 23. 21. 2½. Dr. John L. Leconte.

Genus **HALDEA**, Baird & Girard.

Gen. Char. Head elongated, ellipsoid, distinct from the body. Prefrontal plate single. Postfrontals large, entering together with the loral into the orbit, thus suppressing the anteorbitals. Postorbital one. Two nasals. Eyes proportionally large, circular. Scales carinated. Postabdominal scutella bifid. Subcaudals divided. Unicolor.

Haldea striatula, B. & G.—Grayish brown above, soiled yellow beneath, (said to be reddish gray above, and salmon-colored beneath, in life). A narrow light chestnut band across the middle of the occipitals, spreading over the angle of the mouth. Dorsal scales in 17 rows.

Syn. *Coluber striatulus*, Linn. Syst. Nat. I, 1766, 375.—Gm. *Linn.* Syst. Nat. ed. xiii, I, iii, 1788, 1087.—Harl. Journ. Acad. Nat. Sc. Philad. V, 1827, 354; and Med. & Phys. Res. 1835, 117.

Calamaria striatula, Schl. Ess. Phys. Serp. Part. descr. 1837, 43.—Holbr. N. Amer. Herp. III, 1842, 123. Pl. xxix.

Brown Snake.

Vertical plate elongated, hexagonal. Occipitals proportionally very long, subround exteriorly. Prefrontal subtriangular. Portion of postfrontals seen from above, oblong, dilated on the face, and approximating the postnasal and upper part of the orbit. Rostral tapering upwards. Nostril opening in the posterior margin of the prenasal plate. Loral elongated, situated above the 2d and 3d labials, and forming, with the postfrontal, the anterior part of the orbit. Eyes circular. Superciliaries proportionally large. One angular postorbital, elevated, the fourth labial forming the lower portion of the posterior part of the orbit. Temporal shields of medium size. Mouth deeply cleft. Upper labials 5; 4th and 5th very large. Inferior labials 6; 5th disproportionally the largest.

Body slender, subcylindrical; tail short, and very much tapering. Scales lanceolated, in 17 rows, all carinated, very narrow along the back; outer row conspicuously broader, with an obsolete carination.

Richmond, Va.	128+1. 36. 17.	$9\frac{3}{4}$. $1\frac{3}{4}$.	C. W. Keesee.
"	129+1. 37. 17.	$7\frac{1}{4}$. $1\frac{5}{8}$.	"
Charleston, S. C.	126+1. 46. 17.	$9\frac{1}{4}$. $1\frac{3}{8}$.	Dr. S. B. Barker.
"	123+1. 46. 17.	$7\frac{3}{8}$. $1\frac{1}{2}$.	"
Kemper Co., Miss.	125+1. 44. 17.	$8\frac{1}{2}$. $1\frac{3}{4}$.	D. C. Lloyd.

Genus **FARANCIA**, Gray.

Gen. Char. Head subelliptical, elongated, slightly distinct from the body. Prefrontal plate single. One nasal, grooved beneath the nostril. No anteorbital; postfrontal and loral constituting the anterior portion of the orbit. Two postorbitals. Eyes rather small. Scales smooth. Postabdominal scutella bifid. Subcaudal in pairs.

Syn. *Farancia*, Gray, Zool. Misc. 1842, 68; and Catal. of Snakes in Brit. Mus. 1849, 74.

Farancia abacurus, B. & G.—Body and head above bluish black, with subquadrate red spots on the flanks. Abdomen red, with transverse or alternating bluish black irregular spots. Dorsal scales disposed in 19 rows.

Syn. *Coluber abacurus*, Holbr. N. Amer. Herp. I, 1836, 119. Pl. xxiii.
Homalopsis Reinwardtii, Schl. Ess. Phys. Serp. Part. descr. 1837, 357.
Hydrops Reinwardtii, Gray, Zool. Misc. 1842, 67.
Hydrops abacurus, Dum. & Bibr. Erp. Gen. —— Tab. 65.
Helicops abacurus, Holbr. N. Amer. Herp. 2d. ed. III, 1842, 111. Pl. xxvi.
Farancia Drummondi, Gray, Zool. Misc. 1842, 68.
Farancia fasciata, Gray, Catal. of Snakes, Brit. Mus. 1849, 74.
Red-Bellied Snake; Horn Snake.

Vertical plate subhexagonal, elongated, sides nearly parallel, pointed posteriorly. Occipitals elongated, angular, posteriorly tapering. Postfrontals subangular, entering in the orbit. Prefrontal angular, well developed. Rostral much broader than high, concave beneath. Nostril in the middle of the nasal plate, visible from above. Loral elongated, horizontal, forming together with the postfrontal, the anterior part of the orbit. Eyes circular. Superciliaries subangular, elongated, well developed. Two angular postorbitals, upper one largest, lower one resting on the commissure between the 4th and 5th labials. One pretemporal shield, large, and four smaller ones. Upper labials 7; 5th and 6th slightly larger. Lower labials 8, 4th largest; the two posterior ones scale-like. Mental scutellæ two

pairs, nearly equal in length, posterior pair more tapering. Body subcylindrical, opalescent; tail proportionally short and conical. Scales perfectly smooth, rhomboidal; outer row somewhat broader than the rest. The five medial rows smaller.

Color uniform bluish black above. On the two outer rows the ground-color assumes the shape of vertical bands, from one and a half to two scales broad, leaving an intermediate space from two to three scales wide, which is red in life, and dull yellow in specimens preserved in alcohol. Both the red and bluish black extend on the abdomen, the former being the ground-color, and the vertical bands of the flank confluent on the middle of the abdomen, either directly opposite or alternating.

Anderson, S. C.	171+2.	47.	19.	31⅝. 5⅝.	Miss C. Paine.
Prairie Mer Rouge, La.	173+2.	47.	19.	30¼. 7⅝.	Jas. Fairie.
"	173+2.	47.	19.	16. 2¾.	"
"	—	—	19.	— —	"
"	—	—	19.	— —	"

Genus **ABASTOR**, Gray.

Gen. Char. Head subconical, continuous with the body. Cephalic plates normal. Vertical plate elongated. One nasal, grooved beneath the nostril. No anteorbitals. One loral together with the postfrontals constituting the orbit anteriorly. Two postorbitals. Eyes of medium size, circular. Scales smooth. Penultimate and last abdominal scutella bifid. Subcaudal all bifid.

Syn. *Abastor*, Gray, Catal. of Snakes in Brit. Mus. 1849, 78.

Abastor erythrogrammus, Gray.—Bluish black, opalescent, with three longitudinal lines of dull yellow (red in life). Abdomen dull yellow (flesh-colored in life), with a series of bluish-black spots on each side. Dorsal scales in 19 rows.

Syn. *Coluber erythrogrammus*, Daud. Hist. Nat. Rept. VII, 1799, 93. Tab. 83, fig. 2.—Holbr. N. Amer. Herp. 1st ed. I, 1836, 115. Pl. xxii.

Helicops erythrogrammus, Wagl. Nat. Syst. Amph. 1830, 170.—Holbr. N. Amer. Herp. 2d ed. III, 1842, 107. Pl. xxv.

Homalopsis erythrogrammus, Boie, Isis. 1827, 551.

Abastor erythrogrammus, Gray, Catal. of Snakes in Brit. Mus. 1849, 78.

Vertical plate subhexagonal, long, maintaining its width posteriorly to the point where it enters between the occipitals. Occipitals long, anteriorly and posteriorly angular, rounded exteriorly. Postfrontals polygonal, entering into the orbit. Prefrontals proportionally small and subtriangular. Rostral very broad. Nostril in the middle of the nasal, with a groove beneath. Eyes very large. Loral narrow, forming with the postfrontals the anterior portion of the orbit. Superciliaries large, elongated, sides undulated. Two rounded postorbitals, lower one smallest. A very long temporal shield extending backwards beyond the occipitals, and two or three smaller ones, scarcely distinguishable from the scales. Mouth deeply cleft. Upper labials 7, 6th larger; lower labials 7; 4th larger. Two pairs of

mental shields, posterior pair smallest, extending backwards beyond the 4th inferior labial. Scales subrhomboidal, smooth, constituting 19 longitudinal rows; outer rows considerably larger, the other nearly equal amongst themselves, except the second row, which is somewhat larger.

Ground-color above bluish black. Dorsal longitudinal red line narrow, embracing only the medial rows of scales, extending from the occipitals to a little way beyond the anus. On each side of this there are three rows of scales of the ground-color. Then a longitudinal red line, broader than the medial one, though covering only one row of scales, then again three rows of the ground-color. Of the remaining two outer rows of scales, the outermost is uniform reddish yellow, and the bases of the scales of the second row have a spot of bluish black. Beneath, two series of bluish black subelliptical and transverse spots, one spot on the exterior third and anterior margin of each scutella. The plates of the head are narrowly margined with yellow. The labials are yellow, with a central black spot.

Southern States. (?)	182+1. 37. 19.	$15\frac{3}{4}$. $2\frac{3}{8}$.	Rev. J. G. Morris.
"	185+1. — 19.	$14\frac{3}{4}$. $\frac{7}{8}$.	"
Savannah, Ga.	179+1. 41. 19.	10. $1\frac{1}{2}$.	R. R. Cuyler.
"	179+1. 37. 19.	10. $1\frac{3}{8}$.	"

Genus **VIRGINIA**, Baird & Girard.

Gen. Char. Head subelliptical, detached from the body. Cephalic plates normal. Two nasals; posterior one not invaded by the nostril. Postfrontals and loral entering into the orbit, and suppressing the anteorbitals. Two postorbitals. Mental scutellæ two pairs. Eyes of medium size, circular. Scales smooth. Postabdominal scutella bifid. Subcaudal all divided.

Virginia Valeriæ, B. & G.—Yellowish or grayish brown above, with minute black dots irregularly scattered, or constituting two series. Beneath lighter. Dorsal scales in 15 rows.

Vertical plate hexagonal, more or less elongated; occipitals oblong, exteriorly rounded. Postfrontals irregularly angular, produced into the orbit. Prefrontals subtriangular, proportionally small. Rostral narrow, and tapering upwards. Nostrils in the middle of the posterior margin of the prenasal. Loral elongated, forming together with the postfrontals, the anterior portion of the orbit. Eyes circular. Superciliaries rather large, oblong, elongated. Postorbitals two (angular), lower one between the 4th and 5th labials. Mouth deeply cleft. Upper labials 6, 5th largest; inferior labials 6, 4th largest. Temporal shields four or five, well developed. Body slender, subcylindrical, flattened beneath; tail very short, diminishing very rapidly towards its acute tip.

The scales are subrhomboidal and perfectly smooth; the two outer rows considerably broader than the rest, then diminishing gradually towards the middle line of the back.

Ground-color uniform yellowish or grayish brown; dull yellow beneath. Minute black dots are in most cases scattered along the upper part of the body, forming sometimes two longitudinal series. Along the middle of each scale is a faint light line, which makes the

body appear as if striated. On the outer rows this light line is broader, and appears as a succession of oblong spots.

Kent Co., Md.	127+1. 25. 15.	9⅜.	1¼.	Miss V. Blaney.
Maryland.	122+1. 36. 15.	7⅞.	1⅛.	Prof. C. B. Adams.
Washington, D. C.	123+1. 25. 15.	7½.	1.	(on dep.) J. Varden.
"	125+1. 24. 15.	8⅛.	1⅛.	"
"	128+1. 25. 15.	10⅞.	1½.	"
"	125+1. 29. 15.	8¼.	1⅛.	"
Anderson, S. C.	125+1. 27. 15.	8½.	1⅛.	Miss C. Paine.
"	118+1. 25. 15.	7⅛.	1.	"

Genus **CELUTA**, Baird & Girard.

Gen. Char. Head elongated, subelliptical, continuous with the body. Cephalic plates normal. Vertical broad. Superciliaries very small. One nasal, nostril in the middle. No anteorbital. Orbit formed chiefly by the loral, which is large, and slightly by the postfrontals. Scales smooth. Postabdominal scutella bifid. Subcaudals divided. Unicolor.

Differs from *Brachyorrhos* in having two pairs of frontals, and smooth scales.

Celuta amœna, B. & G.—Above uniform chestnut-brown, opalescent; light yellow (bright salmon-color in life) beneath. Dorsal scales in 13 rows.

Syn. *Coluber amœnus*, Say, Journ. Acad. Nat. Sc. Philad. IV, 1825, 237.—Harl. Journ. Acad. Nat. Sc. Philad. V, 1827, 355; and Med. & Phys. Res. 1835, 118.—Storer, Rep. Rept. Mass. 1839, 226.

Calamaria amœna, Schl. Ess. Phys. Serp. Part. descr. 1837, 31. Pl. i, figs. 19 and 20.

Brachyorrhos amœnus, Holbr. N. Amer. Herp. III, 1842, 115. Pl. xxvii.

Ground Snake; Worm Snake.

Head very small; vertical plate hexagonal, nearly as broad as long. Prefrontals angular, one-third the size of postfrontals, which are likewise angular, and enter posteriorly into the upper portion of the orbit in front. Occipitals proportionally large. Rostral broad, and well developed. Nasal single, nostril in the middle of the anterior half. A large loral forming with the postfrontal the anterior part of the orbit. A quadrangular and elevated postorbital. Superciliaries very small and narrow. Snout protruding. Eyes circular, over the commissure of the 3d and 4th labial. Upper labials 5, 5th largest. Inferior labial 6, 3d largest. Temporal shields well developed.

Body very glossy, subcylindrical. Tail short, tapering into a point. Scales rhomboidal, broad, all perfectly smooth. Outer row somewhat larger. Postabdominal scutella bifid.

The specimen figured by Schlegel, and which he had from Tennessee, exhibits only one pair of frontal plates, whilst the numerous specimens from the eastern part of the United States, examined by us, are all provided with two such pairs. Of two specimens from Missssippi, one corresponds exactly with the figure given by Schlegel, whilst the other has three frontal plates, a posterior pair, and the right plate of the anterior pair. This circumstance has warned us against distinguishing, for the present, a western species from an eastern. Schlegel had ten individuals in his possession, but we are not told whether they all agreed together, as no importance is given by that author to the presence of one pair of frontals only. Should all the western specimens agree in the deficiency of the prefrontals, this would undoubtedly become a character of some importance.

Carlisle, Pa.	128+1. 30. 13.	$11\frac{3}{4}$. $1\frac{5}{8}$.	S. F. Baird.
"	120+1. 36. 13.	$8\frac{3}{8}$. $1\frac{1}{2}$.	"
"	131+1. 29. 13.	$10\frac{1}{4}$. $1\frac{1}{2}$.	"
"	120+1. 33. 13.	$6\frac{3}{4}$. $1\frac{1}{4}$.	"
Foxburg, Pa.	119+1. 26. 13.	7. $\frac{15}{16}$.	"
Washington, D. C.	131+1. 28. 13.	$10\frac{3}{8}$. $1\frac{3}{8}$.	J. Varden.
Mount Vernon, Pa.	129+1. 27. 13.	12. $1\frac{1}{2}$.	W. B. Parker.
Clarke Co., Va.	131+1. 24. 13.	$10\frac{13}{16}$. $1\frac{3}{8}$.	Dr. C. B. Kennerly.
Anderson, S. C.	131+1. 28. 13.	$10\frac{7}{8}$. $1\frac{9}{16}$	Miss C. Paine.
"	126+1. 27. 13.	$10\frac{1}{8}$. $1\frac{3}{8}$.	"
"	130+1. 26. 13.	$10\frac{1}{2}$. $1\frac{1}{2}$.	"
Mississippi.	120+1. 33. 13.	$8\frac{3}{4}$. $1\frac{11}{16}$.	Dr. B. F. Shumard.
"	121+1. 35. 13.	$8\frac{1}{8}$. $1\frac{1}{2}$.	"

Genus **TANTILLA**, Baird & Girard.

Gen. Char. Head slender, continuous with the body. Cephalic plates normal. Postfrontals proportionally large, separated from the labials to which they approximate, between the postnasal and anteorbital. Two nasals, nostrils in the anterior plate. No loral. Anterior orbital one; posterior one or two. Eyes below the medium size. Body slender, subcylindrical; tail tapering. Scales smooth in in 15 rows. Postabdominal scutella bifid. Subcaudal all divided. Unicolor.

1. Tantilla coronata, B. & G.—One anteorbital, two postorbitals. Body uniform reddish brown; head deep chestnut-brown, with a black band across the neck above, in advance of which is a narrow lighter space.

Snout prominent. Vertical plate hexagonal, anteriorly and posteriorly acute. Occipitals slender, rounded exteriorly. Postfrontals angular, excluded from the orbit, though extending on the sides of the head. Prefrontals triangular. Rostral proportionally broad. Nostrils situated on the posterior margin of the prenasal plate, and visible from above. Postnasal elongated, contiguous anteriorly to the anteorbital plate, and above to the postfrontal. No loral plate. Eyes rather small, circular. Superciliaries proportionally large, angular. Anteorbital one; postorbitals two, all angular. A large pretemporal shield, and two smaller ones behind. Mouth deeply cleft. Upper labials 7; 7th the largest; 3d and 4th beneath the eye. Inferior labials 7; 4th the largest. Mental scutellæ one pair. Body slender, tail rather short, tapering into a point. Scales subelliptical, considerably broader in outer row.

Ground-color of body uniform reddish brown; light beneath. Head deep chestnut-brown; upper part of neck with a blackish brown half-ring, covering 3 scales in length, between which and the head a narrow space of the ground-color exists, across the tip of the occipitals.

Kemper Co., Miss. 143+1. 35. 15. $8\frac{3}{4}$. $1\frac{5}{16}$. D. C. Lloyd.

2. Tantilla gracilis, B. & G.—Anterior and postorbitals one each. Color uniform greenish brown above, lighter beneath; head darker.

Vertical plate subhexagonal, much shorter than in *T. coronata*. Postfrontals separated from 2d upper labial by the postnasal. Nostril in the postmargin of the prenasal. Eyes very small and circular. Superciliaries proportionally smaller and narrower than in *T. coronata*. One anteorbital and one postorbital, both angular. Mouth deeply cleft. Upper labials 6; 5th and 6th equally larger than the rest; 3d and 4th beneath the eye, entering slightly into the orbit anteriorly and posteriorly. Temporal shields two, narrow and elongated. Body slender and subcylindrical, covered above with subrhomboidal or elliptical and smooth scales, constituting 15 rows; outer row but slightly larger than the three or four succeeding rows. Tail very slender.

Ground-color uniform greenish brown, lighter beneath. Head darker.

Indianola.	129+1. 45. 15. 7¼. 1§.	Col. J. D. Graham.
"	— — 15. — —	"

Genus **OSCEOLA**, Baird & Girard.

Gen. Char. Head subelliptical, distinct from the body. Cephalic plates normal. Vertical hexagonal. Postfrontals very large, extending to the upper labials, and suppressing the loral. Two nasals, with nostril intermediate. One anterior and two posterior orbitals. Mental scutellæ 2 pairs. Eyes large. Body slender, subcylindrical. Tail tapering. Scales smooth. Postabdominal scutella entire. Subcaudal bifid.

Osceola elapsoidea, B. & G.—Body red, crossed by pairs of black rings enclosing each a white one. Scales disposed in 19 rows.

Syn. *Calamaria elapsoidea*, Holbr. N. Amer. Herp. III, 1842, 119. Pl. xxviii.

Snout projecting over the lower jaw; mouth deeply cleft. Vertical plate hexagonal, longer than broad anteriorly. Occipitals large, elongated, and angular. Postfrontals very large, extending to the 2d upper labial. Prefrontals proportionally well developed and trapezoidal. Rostral very broad. Nostrils very large, occupying the whole inner margin of the nasals, and visible from above. Anteorbital narrow, resting on the 3d labial. Middle of the eye over the commissure of the 3d and 4th labial. Two angular postorbitals, inferior one situated on the commissure, between the 4th and 5th labials. One large temporal shield, anterior, several posterior ones smaller. Upper labials 7, 6th largest; inferior labials 7, 5th largest.

Body subcylindrical, deeper than broad; tail forming about the eighth of the total length. Scales rhomboidal, perfectly smooth, constituting 19 rows; the outer row slightly broader than the rest.

Ground-color brilliant red above, fading below, annulated with 15 pairs of jet-black rings from head to anus, and three pairs on the

tail, each pair enclosing a white ring. Head from the eyes to the snout red, vertical plate maculated with black. A black bar across the occipitals to the temporal shields, and another on the neck, between which a yellowish ring, narrow above, and spreading over the angle of the mouth, post upper labials and inferior surface of the head. The black rings cover from two to three scales, and the intermediate white, one scale. The red spaces between the black embrace from 4 to 7 scales. The black rings taper towards the sides, whilst the white ones are spreading.

Charleston, S. C. 175. 44. 19. $17\frac{3}{8}$. $2\frac{3}{4}$. Dr. S. B. Barker.

In a specimen from Mississippi there are 21 pairs of black rings from the head to the anus, narrower than in the specimen from Charleston, and interrupted on the abdomen. The intermediate white is of about the same width in each. On the tail there are 5 pairs of black rings, all the rings at the same distance apart, and equal in width to their interspaces.

Mississippi. 180. 54. 19. 17. $2\frac{3}{4}$. Dr. B. F. Shumard.

Genus **STOREKIA**, Baird & Girard.

Gen. Char. Head subelliptical, distinct from the body. Cephalic plates normal. Loral plate absent. Orbitals, two posterior; one or two anterior. Nasals two, rather large. Body small, scarcely exceeding a foot in length, subcylindrical; tail comparatively short, tapering. Dorsal scales 15–17 rows, all carinated. Abdominal scutellæ 120–140; posterior one bifid. Subcaudal, all divided, from 41 to 51 in number. Color brown, with two dorsal dotted lines.

1. Storeria Dekayi, B. & G.—One anterior and two posterior orbitals. Dorsal rows 17. Gray or chestnut-brown above, with a clay-colored dorsal band, margined by dotted lines. A dark patch on each side of the occipital; a dark bar between this and the eye, and two below the orbit.

Syn. *Tropidonotus Dekayi*, Holbr. N. Amer. Herp. III, 1842, 53. Pl. xiv.—Dekay, N. York Fauna. Rept. 1842, 46. Pl. xiv, fig. 30.
Tropidonotus ordinatus, Storer, Rep. Rept. Mass. 1839, 223.

Body rather thick in the middle, tapering to the tail and head, both of which are small and slender. Eyes small. Nostril principally in the prenasal. Seven upper labials on each side. Lower labials seven, of which the 4th and 5th are very large, extending quite to the mental. A second plate parallel with the 6th, rather longer. Exterior dorsal row of scales largest, rest diminishing gradually to the back.

Color grayish brown, sometimes chestnut-brown above and on the sides, with a dorsal stripe extending from occiput to the end of the tail, of a decidedly lighter tint, and about three and two half-scales in width. This is bordered along each outer edge by a series of rounded brown dots, occurring at intervals of about two scales; of these there are about 70 pairs from occiput to anus. Each dot occupies generally a single scale, but is sometimes seen on the skin on each side. On separating the scales, the skin on each side of the 4th lateral row of scales exhibits a second series, similar to and

alternating with the first. A third series opposite to the first and alternating with the 2d, is seen along the 2d row, and there are even traces of a fourth between the abdominal and first dorsal series. Of these only the first-mentioned series is visible under ordinary circumstances, and is generally only to be made out on separating the scales, the color only occasionally being shown on their margins. The first pair of dots just behind and across the angle of the jaw is enlarged into a crescentic patch, concave before. A second narrow vertical patch of black across the sides of the head, anterior to a point half-way between the first and the eye; this sometimes interrupted in the middle. The posterior margins of the 3d and 4th (sometimes the 2d) labials black, showing two vertical lines below the orbit. Plates on top of head mottled chestnut-brown.

Color beneath grayish white, with one or two black specks near the exterior edge of each scale. Tail unicolor.

In some specimens the brown of the sides increases in depth to the dorsal stripe. In some, too, a transverse bar connects the lateral spots across the back.

In a very young specimen from Grosse Ile, the colors are dark chestnut above, with the interval between the occipital patches and the cephalic plates and orbit white, crossed by a vertical black line on the angle of the mouth. Length 4½ inches.

Racine, Wisc.	128+1.	47.	17.	13. 2⅝.	Dr. P. R. Hoy.
Grosse Ile, Mich.	125+1.	50.	17.	8¼. 1¾.	Rev. Chas. Fox.
Cleveland, Ohio.	131+1.	48.	17.	11½. 2¼.	Dr. Kirtland.
Westport, N. Y.	123+1.	61.	17.	10¾. 2¾.	S. F. Baird.
Harrisburg, Pa.	120+1.	—	17.	7¾. 2½.	"
Framingham, Mass.	127+1.	45.	17.	11¼. 2¼.	"
Pittsburgh, Pa.	—	—	—	— —	G. W. Fahnestock.
Washington, D. C.	129+1.	41.	17.	12. 2¼.	S. F. Baird.
Anderson, S. C.	120+1.	—	17.	9½. 3¼.	Miss C. Paine.
"	130+1.	47.	17.	12¼. 2¼.	"
Georgia.	136+1.	49.	17.	— —	Major Leconte.
New Orleans. ?	124+1.	46.	17.	11. 2.	J. Varden.
New Braunfels, Tex.	—	—	—	— —	F. Lindheimer.

2. Storeria occipito-maculata, B. & G.—Orbitals 1, two anterior, two posterior. Dorsal scales in 15 rows. Above gray, or chestnut-brown, sometimes with a paler vertebral line; beneath red or salmon-color. Three distinct light colored spots behind the head, and a smaller one on the 4th or 5th upper labial.

Syn. *Tropidonotus occipito-maculatus,* Storer, Rep. Rept. Mass. 1839, 230. *Coluber venustus,* Hallow. Proc. Acad. Nat. Sc. Philad. III, 1847, 274; and vol. IV, 1849, 245.

Nostril almost entirely in the prenasal plate, in some cases the postnasal not entering at all into it. Five to six upper labials, increasing in length posteriorly, lower labials 6 to 7, similarly constituted. Vertical plate hexagonal, shield-shaped. Muzzle rather broad, eyes larger than in *S. Dekayi.*

Color above light chestnut-brown, sometimes chestnut-gray, at others olivaceous: a paler vertebral line from occiput to end of tail, about three scales in width; on each side of this may be seen a series of minute brown spots, produced by the brown bases of the scales in the 3d row on each side from the central series. Sometimes the brown covers the whole scale, and gives rise to two dorsal lines; at others it is almost entirely wanting, and this, connected as it generally is with a less distinct vertebral band, gives the impression of a uniform tint above. Upper margin of the exterior dorsal lines brighter yellowish, giving the effect in some cases of a lateral narrow light line. Abdomen in life salmon-color, in alcohol whitish yellow, with the sides finely mottled with dark-brown, sometimes obsoletely, at others constituting very distinct bands. These generally do not encroach upon the dorsal scales. Occasionally, however, the middle of the exterior row of scales exhibits a dark stripe. Immediately behind the occipital plates, and on the median line, is seen a dull salmon-colored blotch, on each side of which, over the angle of the jaws, is a similar smaller one. The intervals between these blotches sometimes darker. A small salmon-colored spot on the 4th or 5th upper labial, behind the orbit. Plates on the top of the head blotched with darker. Lower jaw minutely dotted with brown.

Description of a living specimen caught at Westport, N. Y., August, 1847.—"Iris dark chestnut, rather lighter above and externally. General color above dull chestnut-brown. Attentively examined, however, when wet, there is seen a faint dorsal stripe of

lighter color, bordered by a line on each side of darker, which fades off to the abdominal scutellæ until the color is the same as the dorsal line, or even lighter. Behind the head are three light yellowish brown occipital spots. Whole under parts, except the chin or throat, bright brick-red. Chin and throat white, mottled finely with gray and black, like pepper and salt. An irregularly defined stripe of the same mottling along the sides, from head to anus, crossing the abdominal scutellæ near the outside."—S. F. Baird, Mss.

Westport, N. Y.	124+1.	43.	15.	9¼.	1¾. S. F. Baird.
Portland, Me.	—	—	—	—	— Prof. Caldwell.
Lake Superior.	—	—	—	—	— Prof. Agassiz.
Racine, Wisc.	—	—	—	—	— Dr. P. R. Hoy.
Foxburg, Pa.	—	—	—	—	— S. F. Baird.
Madrid, N. Y.	128+1.	50.	15.	11.	2¼. E. A. Dayton.
Pittsburgh, Pa.	—	—	—	—	— G. W. Fahnestock.
Pottsville, Pa.	—	—	—	—	— Mr. Sheafer.
Charleston, S. C.	—	—	—	—	— Dr. S. B. Barker.
Anderson, S. C.	—	—	—	—	— Miss C. Paine.
Georgia.	—	—	—	—	— Major Leconte.

A very strongly marked variety, which the condition of the specimens does not allow us to characterize or determine as a species, is seen in individuals from Charleston and Anderson, S. C., in which the body is dark slate-blue, except the middle third of the abdomen, which is yellowish white. The dorsal lines of black dots are visible through the ground-color; the lateral lighter line is scarcely perceptible. The three occipital spots, and that on the labials, are distinct.

Charleston, S. C.	—	—	—	—	— Dr. S. B. Barker.
Anderson, S. C.	125+1.	53.	15.	8¼.	2½. Miss C. Paine.
Near Mammoth Cave, Ky.	118+1.	47.	15.	8½.	2. Dr. B. F. Shumard.

Another variety is seen in a specimen from Pittsburgh, Pa., where, in addition to the coloration just mentioned, the vertebral stripe is light chestnut, contrasting strongly with the ground-color.

Genus **WENONA**, Baird & Girard.

Gen. Char. Head small, conical, slightly swollen on the temporal region, though not separated from the body by a contracted neck. Snout protruding beyond the lower jaw. Mouth moderately cleft. Eyes very small. A broad and short vertical; two or three pairs of frontals. Occipitals very small, the size of the superciliaries. One nasal, a posterior one; nostril between it and the prefrontals, which extend over the place occupied elsewhere by the prenasal. Loral united with postfrontals or separated. One very large anteorbital; two or more postorbitals. Numerous small temporal shields. Scales very small, lozenge-shaped, smooth, in 45 dorsal rows. Postabdominal scutella not divided. Subcaudal all entire. Unicolor. Tail proportionally short, stout, terminating blunt.

Syn. *Wenona*, B. & G. Proc. Acad. Nat. Sc. Philad. VI, 1852, 176.

1. Wenona plumbea, B. & G.—Uniform bluish lead-color above; uniform yellowish white beneath. Three pairs of frontal plates. Middle pair united with the loral, and thus extending to the labials. Labials not entering into the orbit. Dorsal scales in 45 rows.

Syn. *Wenona plumbea*, B. & G. Proc. Acad. Nat. Sc. Philad. VI, 1852, 176.

Upper surface of head slightly convex, snout rounded and prominent. Vertical plate as broad as long, obtuse angled anteriorly, rounded posteriorly. Postfrontals small and triangular, the smallest of all the frontals. Middle frontals subangular, transversely elongated, reaching the labials at the commissure of the 2d and 3d, occupying the place of the loral. Prefrontals angular posteriorly, rounded anteriorly, reaching the first labial, and occupying the place of the prenasal. Rostral broad and large. Postnasal subtriangular, elongated, apex directed backwards. Nostril vertically elongated, situated between the lateral expansion of the prefrontals and the postnasal. Occipitals quite small, and united in one plate,

perhaps accidentally. Anteorbital subpyramidal, apex reaching the upper surface of head, touching the vertical, and produced between the superciliaries and postfrontals. Superciliaries subquadrangular, more developed on the surface of the head than in the orbit. Three postorbitals, with rounded margins, upper one slightly the largest, situated near the upper surface of head, and might be considered as a second superciliary. Two suborbitals; anterior larger, subhexagonal, situated above the commissure between the 4th and 5th labials; posterior rounded, oblong, above the posterior half of the 5th labial. Temporal shields numerous and small, scalelike. Cleft of mouth slightly arched upwards. Upper labials 9; three anterior ones much higher than the rest; 5th broadest, none reaching the orbit. Lower labials inconspicuous; three anterior ones the largest.

Body subcylindrical, deeper than broad; abdomen comparatively narrow. Tail short, thick, blunt at its extremity. Scales small, irregular, subelliptical, or sublozenge-shaped; on the outer row very large proportionally, higher than long. In the 2d row the scales are still larger; but in the remaining rows they become uniformly small, scarcely diminishing towards the middle line of the back. On the tail, however, they are somewhat larger.

Puget Sound, Or. 206. 37. 45. 17⅝. 2½. (on dep.) Expl. Exped.

2. Wenona isabella, B. & G.—Uniform isabel-color above, dull yellow beneath. Two pairs of frontal plates. An angular loral. Upper 4th and 5th labials entering into the orbit. A small anterior vertical between the postfrontals. Dorsal scales in 45 rows.

Syn. *Wenona isabella,* B. & G. Proc. Acad. Nat. Sc. Philad. VI, 1852, 176.

Upper surface of head flat, snout subtruncated. Vertical broader than long, rounded posteriorly. A small second vertical between the postfrontals. Occipitals united in one small narrow plate. Two pairs of frontals only; postfrontals much larger, subrounded, forming on the right side a continuous plate with the loral, whilst on the left side the loral is distinct from the postfrontal which itself is angular. Prefrontals subangular, extending to the first upper labial, and occupying the place of the prenasal. Rostral broad, obtuse angled above. Anteorbital pyramidal, extending to the surface of the head, produced between the postfrontals and superciliary, and touching the vertical. Superciliary proportionally larger than in *W. plumbea,*

irregularly rounded. Three subangular and polygonal postorbitals. Numerous temporal shields of the size of the postorbitals, and but slightly larger than the scales. Cleft of mouth horizontal. Upper labials 9; the 5 anterior ones higher, the 4th and 5th entering into the orbit. Lower labials 10; the 4 anterior ones larger than the rest, which, as in *W. plumbea*, are not conspicuous.

Body subcylindrical, deeper than broad; abdomen narrow. Tail short and thick, blunt posteriorly. Scales as in *W. plumbea*, only proportionally smaller.

Puget Sound, Or. 210. 34. 45. $15\frac{1}{4}$. $2\frac{1}{16}$. (on dep.) Expl. Exped.

Genus **RENA**, Baird & Girard.

Gen. Char. Head slightly depressed and continuous with the body. Snout blunt and rounded, overlapping considerably the lower jaw. A large rostral plate. One nasal. A pair of fronto-nasals. One eye shield, or ocular. A pair of parietals. A pair of postparietals. Medial row of scales extending over the head to the rostral. Nostrils lateral, oblong, situated between the nasal and fronto-nasal. Eyes not conspicuous. Mouth inferior, semilunar.

1. Rena dulcis, B. & G.—Reddish brown above; reddish white beneath. Fifteen rows of scales. Body depressed. Eye shield separated by a small plate from the series representing the vertical.

Body slender, elongated, rather stouter posteriorly than anteriorly, depressed, broader than deep. Tail very short, subconical, bluntly terminated, about $\frac{1}{20}$ of the total length. Rostral rounded, tapering, separating the fronto-nasals for nearly their whole length. Fronto-nasals proportionally large, tapering upwards, and undulating. Nasal subtriangular, nostril situated on the middle of its upper margin, close to the fronto-nasal. Eye shield large, elevated, irregularly oblong, extending to the top of the head from the margin of the jaw. Parietal and postparietal similar, transversally elongated, the postparietal somewhat larger. Four shield-shaped scales in a longitudinal series between the postparietals, parietals, eyeshield, fronto-nasals on each sides, and the rostral in front, occupy the place of the vertical. On the crown, and just above the eye-shield, is a small semilunar plate, separating it from the series just described, and probably the homologue of the supraorbital. The margin of the upper jaw is formed in front by the rostral; on the sides next to the rostral by the nasal, behind which is a subquadrangular, obliquely elevated labial, limited above by the fronto-nasal, and posteriorly by the eye-shield, which enters likewise in the upper labial series. Posterior to the eye-shield is a subtriangular labial at the angle of the jaw, approximating above the parietal, and limited behind by the

postparietal and the beginning of the scales. Inferior labials four, similar to the scales under the throat.

The scales present a great uniformity throughout the whole length of the body; a little smaller beneath than above.

Between San Pedro and Camanche Springs, Tex. } length $7\frac{1}{2}$. tail $\frac{4}{10}$. Col. J. D. Graham.

2. Rena humilis, B. & G.—Uniform chestnut-brown, lighter beneath. Scales in 15 rows. Body cylindrical. The eye-shield in contact with the longitudinal series on top of the head.

Body very slender and cylindrical. Tail short, conical, tapering, not acute, $\frac{1}{15}$ of the total length. Head less depressed. Eyes and nostril more distinct than in the preceding species. No supraorbitals. Postparietals much smaller than the parietals. Scales on the abdomen larger than on the back.

Valliecitas, Cal. length 6. tail 4. Dr. John L. Le Conte.

APPENDIX A.

SPECIES EXAMINED, OF WHICH NO SPECIMENS ARE IN POSSESSION OF THE SMITHSONIAN INSTITUTION.

Crotalus oregonus, HOLBR.—Grayish ash above, with narrow lighter lines decussating, so as to form dorsal and lateral rhomboids, with the angles all sharp and well defined, and their margins within the light lines, black. Beneath black. The dark postocular vitta passes above the labials without coming into the edge of the mouth. A light line across the head through the middle of the superciliaries.

SYN. *Crotalus oregonus*, HOLBR. N. Amer. Herp. III, 1842, 21. Pl. iii.

The only known specimen of this strongly marked species, and the same as that upon which Dr. Holbrook based his description, is too much shrivelled to admit of accurate description. In its general features it has a close resemblance to *C. adamanteus*, like it, having the back crossed by decussating light lines, enclosing transversely elongated rhomboids, with all the angles sharp and well defined. Of these rhomboids there are about 32 from head to anus.

The general color is grayish ash, the decussating lines being of a lighter tint of the same. Along the margins of the lozenges, and just within the light lines, is a black border. Scutellæ black, with ash-colored margins, the width of the ash-color diminishing from the head to the tail. There is a narrow, well-defined line across the head, just above the middle of the eye, which then appears to be continuous along the edge of the superciliaries to the angle of the jaw. A second white line starts between the nostril and the eye, and, passing back under the eye, strikes the edge of the mouth at the

7th labial, and extends along to the angle of the mouth: the ends of the anterior lines on opposite sides scarcely appear to meet on the top of the head. The vitta between these two light lines is dark ash, margined with black, and passes back above the labials to the angle of the mouth. The space in front of the second line is black, except a short narrow line produced along the labials anteriorly as a branch of the line in front of the eye. Edges of the nostril light.

The animal is quite young, there being but a single button.

An important feature of distinction from *C. adamanteus* is seen in the fact that the dark line on the side of the head passes above the labials to the angle of the mouth, instead of passing very directly down to the edge of the mouth, considerably anterior to the angle. The sharpness and close approximation of the rhomboids distinguish it from the other Western species. The head is much longer in proportion than in *C. lucifer*.

From the collection of the Academy of Natural Sciences of Philadelphia.

Columbia River. 177. 22. — 12½. 1¾. Thomas Nuttall.

Eutainia concinna, B. & G.—Dorsal rows of scales 21, all carinated. Black, with a dorsal light stripe, and the usual lateral stripes replaced by a series of distinct salmon-colored spots.

Syn. *Tropidonotus concinnus*, Hallow. Proc. Acad. Nat. Sc. Philad. VI, 1852, 182.

Head small; body rather stout. Outer row of scales higher and larger than the rest, which are nearly equal. Above intense black, with a dorsal greenish white line one and two half-scales wide, and extending from head to tip of tail. On each side is a series of vertically elongated distinct spots of a reddish salmon-color, and 75 in number, between the head and anus. They occur on the 2d to the 6th rows of scales, and are half a scale long, the same color being visible on the adjoining skin. The dark intervals are one scale longer than the spots themselves. Beneath greenish black, tinged with white anteriorly. Whole head reddish yellow, tinged above with brown.

A near relative of our *Eutainia Pickeringii*. Belonging to the Academy of Natural Sciences.

Oregon. ♀ 163. 85. 21. 26. 7½. Dr. B. F. Shumard.

Nerodia niger, B. & G.—Head ellipsoid, anteriorly blunt, flattened above. Vertical plate very long, subhexagonal, slightly concave on the sides. Three postorbitals. Loral and nasals proportionally large. Dorsal scales in 23 rows. Color nearly uniform dark-brown on the back, maculated on the flanks and abdomen.

Syn. *Tropidonotus niger*, Holbr. N. Amer. Herp. IV, 1842, 37. Pl. ix. Water Adder.

Body more slender, and head larger than in *N. sipedon*, though provided with 23 rows of scales, all of which are carinated. The scales of the outer row, however, are very large, proportionally more so than in *N. sipedon*, the nearest relative of this species. The prefrontals are triangular. The vertical plate is more elongated than in *N. sipedon*, whilst the occipitals are smaller. The nasals and loral are also larger, as are the labials, though their number is the same in both species. The prefrontals are triangular.

Ground-color chestnut-brown, with the scales streaked with black on the dorsal region, whilst the flanks are mottled, so as to appear darker. The head beneath, and the middle of the abdomen on the anterior portion of the body are yellowish. The sides of the abdomen, and posterior portion of body and tail, are densely maculated with black, almost entirely black beneath the tail.

From the Cabinet of the Academy of Natural Sciences.

Massachusetts. 141+1. 66. 23. 28½. 6½. Dr. D. H. Storer.

Nerodia rhombifer, B. & G.—Vertical plate elongated, narrow, sides nearly parallel. Dorsal scales 27; scales all carinated. Postorbitals two on one side, three on the other. Labials 8, 6th highest. A dorsal series and a lateral on each side of quadrate blotches; the alternating blotches of opposite sides connected across the back by dark lines passing into the dorsal series.

Syn. *Tropidonotus rhombifer*, Hallow. Proc. Acad. Nat. Sc. Philad. VI, 1852, 177.

Ground-color light brown, or when the epidermis is removed, bluish ash. The dorsal dark spots are 50 in number from the head to the tip of the tail, the 35th opposite the anus. The lateral bars alternate with the preceding: they extend between the edges of the

abdomen and the 9th or 10th rows of scales, and are about one and a half scales long, separated by intervals of 2½ or 3 scales. The dark bars crossing the back obliquely, and connecting the alternating bars of opposite sides by their decussation and slight confluence, form the dorsal series of blotches. These lines are about half the width of the vertical bars, appearing like their bifurcations. They divide the back into a succession of transversely elongated hexagons of the ground-color. The dark markings are confined to the skin and the basal halves of the scales, the tips of these in all cases being of the ground-color. Beneath yellowish white, blotched along each side with darker.

Collected by Dr. S. W. Woodhouse, on the Arkansas river and its tributaries, near the northern boundary of the Creek nation, and in possession of the Topographical Bureau.

Arkansas River. 141+1. 70. 27. — — Dr. S. W. Woodhouse.

Nerodia transversa, B. & G.

Syn. *Tropidonotus transversus*, Hallow. Proc. Acad. Nat. Sc. Philad. VI, 1852, 177.

Owing to the imperfect condition of the specimen upon which this species was founded, it has been impossible to determine its true affinities (except the generic), although strongly suspecting it to be the same, or at least very similar to *N. Woodhousii*, B. & G. If they be the same, the name of Dr. Hallowell will of course have priority, although neither the description nor the present condition of the specimen afford conclusive proof on this point. Dr. Hallowell's description is as follows:—"Head large, swollen at the temples, convex posteriorly, flattened between the orbits, depressed in front; a series of subquadrate dark-colored blotches, thirty-six or thirty-seven in number, along the back; a transverse row of oblong bars along the sides, their upper margins alternating with the inferior margins of the dorsal blotches; scales strongly carinated, 23 rows; abdominal scutellæ 144; subcaudal 78.

"*Dimensions.* Length of head 12 lines; greatest breadth 7; length of body 1 ft. (Fr.) 5 inches, 7 lines; length of tail 6 inches; total length 2 ft.

"*Habitat.* Creek boundary, found near the banks of the Arkansas and its tributaries."

Topographical Bureau.

Masticophis flagelliformis, B. & G.

A young individual in the cabinet of the Academy of Natural Sciences of Philadelphia, and labelled "*Coluber reticularis*, DAUD.," present the following characters, after long preservation in alcohol:— Above white, with a series of transverse dark bars across the back, extending from head to tail, about two scales long, and crossing from one side of the abdomen to the other. There is a faint indication of darker lateral lines extending through the centres of the lateral rows of scales. Beneath white, with two series of brown dotted lines extending from the chin for about one-fourth of the length. Plates on the top of the head yellowish, with darker margins.

South Carolina. — — 17. 19. $4\frac{3}{4}$. Acad. Nat. Sc.

APPENDIX B.

SPECIES DESCRIBED BY AUTHORS, BUT OF WHICH NO SPECIMENS COULD BE OBTAINED.

1. Toxicophis atrofuscus, TROOST.—Body above dusky, with light rhomboidal dorsal blotches of smoky gray, disappearing entirely near the tail, which is black.

SYN. *Toxicophis atrofuscus*, TROOST. Ann. Lyc. Nat. Hist. N. Y. III, 1836, 190.

Acontias atrofuscus, TROOST. ibid 180.

Trigonocephalus atrofuscus, HOLBR. N. Amer. Herp. III, 1842, 43. Pl. ix.

"Upper part of the head dark-brown, bordered with gray, which becomes lighter behind the eyes, with a dark longitudinal spot reaching from the orbit to the tympanal bones. Upper lip white, terminating near the tip in gray. Body dusky, variegated with brown spots of smoke-gray; broadest on the back, and disappear on the tail, which is black. Throat marked with black and white, the latter color predominating; belly irregularly spotted with black and white, darkest towards the tail, and in all parts the white is minutely dotted with black."—Holbrook.

Tennessee. 133. 25+18. — 25. $3\frac{2}{5}$. Dr. G. Troost.

The species probably belongs really to the genus *Agkistrodon*, Beauv.

2. Coluber testaceus, SAY.—"Body above pale sanguineous or testaceous; beneath sanguineous, immaculate."—Say.

SYN. *Coluber testaceus*, SAY in *Long's* Exped. Rocky Mts. II, 1823, 48.—HARL. Journ. Acad. Nat. Sc. Philad. V, 1827, 348; and Med. & Phys. Res. 1835, 113.—HOLBR. N. Amer. Herp. III, 1842, 63. Pl. xiii.

"Head subovate, elongated, the snout produced slightly and rounded. The form of the head, as well as the plates that cover it, and the disposition of the eyes and nostrils, appear in the preserved specimen to be precisely similar to those of *Coluber constrictor*. The body is long and slender, and is covered with large, smooth hexagonal scales above, and with broad plates below. The tail is long and slender. The whole upper surface of the animal is pale brick-dust color, the abdomen and below brighter red."—Holbr.

Rocky Mts. 198. 80. — 62. — Thos. Say.

The figure represents the postabdominal scutella as divided. The species perhaps belongs to the genus *Masticophis*, more dorsal rows being represented than probably belong to it. It may prove to be *Masticophis flavigularis*, B. & G.

3. Coluber Sayi, Schl. (non Holbr.)—General color reddish orange, with a dorsal series of transverse blotches, forming bands towards the posterior region of the body. Flanks mottled or maculated.

Syn. *Coluber Sayi*, Schl. Ess. Phys. Serp. Part. descr. 1837, 157.
Coluber melanoleucus var. Say.—Harl. Journ. Acad. Nat. Sc. Philad. V, 1827, 360; and Med. & Phys. Res. 1835, 123.

"This species is beyond all dispute one of the handsomest of the genus (*Coluber*), and as well characterized by the shape of its snout and the plates of its surface as by the beautiful reddish yellow tint predominant over all the regions of the body. The back, however, is of a deeper chestnut-brown, in the midst of which the ground-color appears in the shape of numerous transverse and oval blotches: these two tints constitute towards the posterior region broad and alternating bands, extending to the inferior surface. The anterior region is deeper in color, spotted or maculated with black like the abdomen, or else exhibiting large patches of this same tint.

"The head is distinct from the neck, and covered with plates, the vertical of which is a spherical triangle almost equilateral; the occipitals are noticeable for their small size; the labials are large, and margined with black, but are not to be distinguished from the scales of the body, which are lanceolated, provided with a carina, and disposed in 25 rows.

"There are three postorbital plates and but one anteorbital, preceded by a very small loral. The snout is conical, and terminated

by a plate, which has the shape of a prominent nose, on each side of which are the nasals. Our specimen has two pairs of postfrontals disposed on a single transverse row.

"The bones which constitute the skull are stouter than in the other species of *Coluber*. The tympanum is longer, and the nasals elongated. The intermaxillary is very depressed. The teeth are all of the same length."—Schlegel.

The specimen described was brought from the Rocky Mountains by Mr. Say, and presented to M. Schlegel by Charles L. Bonaparte.

Missouri. 221. 55. 25. — about 4 feet.

The species here referred to belongs undoubtedly to the genus *Pituophis*. The general system of coloration, the peculiar shape and structure of the snout, and the presence of two pairs of postfrontal plates, are characters which this genus alone possesses in the manner just described.

As to Say's variety of *Coluber melanoleucus*, as given by Harlan, it is introduced into the synonymy with some doubt.

4. Coluber vertebralis, Blainv.—"Reddish yellow or pale red, marbled with deep brown, forming a dorsal united series in the shape of a succession of sections of fish vertebræ, becoming isolated and more apart towards the posterior region."

Syn. *Coluber vertebralis*, Blainv. Nouv. Ann. Mus. d'Hist. Nat. III, 1834, 61. Pl. xxvii. figs. 2, 2 a, and 2 b.

"Body elongated and slender anteriorly; head small and comparatively distinct; snout pointed; tail short, conical, and pointed. Nostrils lateral, small, circular, between the two nasal plates. Eyes large, lateral, almost entirely surrounded with the orbital plates. Cephalic plates: two prefrontals and two postfrontals; two lorals superposed. Two anteorbitals and three postorbitals. Abdominal scutellæ 245; subcaudal 64. Scales rather small, lozenge-shaped, smooth, imbricated."

California. — — — — — M. Botta.

This species is not without a certain resemblance to *Pituophis*. The chained dorsal blotches, the acute head, prominent snout, and presence of two lorals, the upper one resembling in shape and posi-

tion an exterior pair of postfrontals, are the characters which lead us to this belief. Its generic affinities, however, cannot be determined without specimens in hand. The smooth scales would militate against the supposition of its being a *Pituophis*.

5. Coluber (Ophis) Californiæ, Blainv.—"Yellow, lighter beneath, darker above, with six longitudinal bands more or less effaced, and more or less anastomosed, of a black color, the upper ones broader and often united."

Syn. *Coluber (Ophis) Californiæ*, Blainv. Ann. Mus. d'Hist. Nat. III, 1834, 60. Pl. xxvii. figs. I, 1 a, 1 b.

"Body of ordinary form and medium length; head proportionally large, depressed; snout short and obtuse. Tail rather short, conical, and pointed. Nostrils lateral, oval, between the two nasal plates, contiguous to the frontals. Eyes of medium size, lateral. Cephalic plates. Two prefrontals and two postfrontals; one loral; one anteorbital and two postorbitals. Scales rather small, lozenge-shaped, imbricated, and perfectly smooth."

California. — — — — — M. Botta.

6. Coluber (Zacholus) zonatus, Blainv.—"Reddish white, entirely annulated with deep black, with two half-rings of the same color on the head."

Syn. *Coluber (Zacholus) zonatus*, Blainv. Nouv. Ann. Mus. d'Hist. Nat. III, 1834, 61.

"Body cylindrical, back depressed, subcarinated, suddenly attenuated posteriorly, and but slightly anteriorly. Head small, tetragonal, with an obtuse and thick snout; tail short, small, and very much tapering, about $\frac{1}{7}$ of total length. Nostrils lateral, large, infundibuliform, in the midst of the two nasal plates. Eyes large and lateral. Mouth deeply cleft; anus very far back. Cephalic plates: two prefrontals and two postfrontals; one loral, very small; one anteorbital and two postorbitals, very small. Scales rather large, rhomboidal, subimbricated, increasing in size from the back towards the sides, subconvex and perfectly smooth."

California. — — — — — M. Botta.

7. Coluber planiceps, Blainv.—"Uniform reddish above, of a soiled white beneath, with a black patch on the occiput and the beginning of the neck."

Syn. *Coluber planiceps*, Blainv. Nouv. Ann. Mus. Hist. Nat. III, 1834, 62. Pl. xxvii, figs. 3, 3 a, 3 b.

"Body slender, rather elongated, cylindrical; head small, depressed, but little distinct; snout short and elliptical; tail rather long, slender, and very much tapering, ¼ of the total length. Nostrils lateral, very small, situated in the middle of the nasal, which is elongated and single. Eyes of medium size. Mouth broad, considerably cleft; anus far back. Cephalic plates: two prefrontals and two postfrontals. No loral. One anterior and one postorbital. Abdominal scutellæ 134, beginning at some distance from the head. Subcaudal 56. Scales broad, convex, very smooth, opalescent, obliquely imbricated."

California. — — — — — M. Botta.

Genus **CHARINA,** Gray.

Gen. Char. Resembles *Wenona* in general shape and appearance, and bears with it many affinities in structure. There are two lorals instead of one; three anteorbitals instead of one; three superciliaries instead of one; and the subcaudal scutellæ much narrower, and more elongated transversely. The comparison of specimens will no doubt show other generic differences inappreciable by the descriptions.

Syn. *Charina*, Gray, Catal. of Snakes in Brit. Mus. 1849, 113.

8. Charina Bottæ, Gray.—Body cylindrical, blunt at each end; pale yellow; back and tail darker.

Syn. *Charina Bottæ*, Gray, Catal. of Snakes in Brit. Mus. 1849, 113.
Tortrix Bottæ, Blainv. Nouv. Ann. Mus. Hist. Nat. III, 1834, 57. Pl. xxvi, figs. 1, 1 a, 1 b.

Genus **OPHTHALMIDION**, Dum. & Bibr.

Gen. Char. Head more or less depressed, covered with plates; rostral plate reeurved under the snout, the tip of which is rounded, and extending to the upper part of the head in the shape of an oval cap. An anterior frontal plate. A frontal proper. A pair of supraoculars. A pair of parietals; no interparietals, or one only. A pair of nasals. A pair of fronto-nasals. A pair of oculars. A pair of preoculars. Nostrils hemidiscoid, opening under the snout, one to the right, the other to the left, between the nasal and fronto-nasal. Eyes lateral, more or less distinct.

Syn. *Ophthalmidion*, Dum. & Bibr. Erp. Gen. VI, 1844, 262; and Catal. Rept. Mus. d'Hist. Nat. II, 1852, 201.

9. Ophthalmidion longissimum, Dum. & Bibr.—Tail double the length of the width of the head, cylindrical, straight, rounded at the tip, and provided with a small spine. Nasal plates in the shape of little subrectangular bands, placed longitudinally on each side at the inferior part of the rostral. Oculars in vertical subhexagonal bands, less developed than the preoculars, and showing the eyes but slightly through. Head yellowish, the whole body of a grayish tint.

Syn. *Ophthalmidion longissimum*, Dum. & Bibr. Erp. Gen. VI, 1844, 263; and Catal. Rept. Mus. Hist. Nat. II, 1852, 201.

N. America. Collected by Comte de Castelnau. Florida. ? ?

The following species given by Schlegel in his *Essai* as North American, cannot be admitted into our fauna without further evidence.

Calamaria melanocephala.....Surinam & Philada
Lycodon clelia.....Philada
Herpetodryas margaritiferus.....New Orleans
Herpetodryas cursor.....New York.
Dryophis Catesboei.....Southern States.
Dipsas annulata.....Delta of Miss.
Homalopsis carinicauda.....New York.
Homalopsis plicatilis, Var......New Orleans.

APPENDIX C.

SPECIES COLLECTED BY JOHN H. CLARK AND ARTHUR SCHOTT, ON THE U. S. AND MEXICAN BOUNDARY SURVEY, UNDER MAJ. WM. H. EMORY, U. S. A., AND RECEIVED TOO LATE FOR INSERTION IN THEIR PROPER PLACES.

1. Crotalus atrox, B. & G. ..... Page 5

Pecos, Tex.	— — 15. 35. $2\frac{6}{8}$.	John H. Clark.
Eagle Pass, Tex.	— — 15. 29. $2\frac{1}{2}$.	Arthur Schott.

2. Toxicophis pugnax, B. & G. ..... Page 20

Eagle Pass, Tex.	138. 43. 25. 28. $4\frac{1}{2}$.	Arthur Schott.

3. Elaps tenere, B. & G. ..... Page 22

The ground-color of the present specimen is red, the same as in *Elaps fulvius;* the fact of its being fawn-colored in the specimen described above must be attributed to the action of the preserving fluid. The specimens here referred to are of a greater size, but exhibit all the other characters by which we have distinguished this species from *Elaps fulvius.*

San Felipe, Tex.	— — — — —	John H. Clark.
Eagle Pass, Tex.	— — — — —	Arthur Schott.

4. Eutainia Marciana, B. & G. ..... Page 36

Eagle Pass, Tex.	— — — — —	Arthur Schott.

5. Heterodon nasicus, B. & G.....Page 61

Specimens of this species vary in the number of small postrostral plates. In some there are only three or four, in others a larger number. Sometimes, instead of a single series of median dorsal spots, there are two, in close contact, and more or less confluent. The narrow light line across the middle of the superciliaries and the high labials are still highly characteristic.

Pecos, Tex.	130+1. 40. 23.	14½. 2⅝.	John H. Clark.
"	141+1. 29. 23.	20½. 2⅜.	"
"	141+1. 37. 23.	23½. 3¼.	"
Eagle Pass, Tex.	144+1. 38. 23.	26½. 3½.	Arthur Schott.

6. Pituophis bellona, B. & G.....Page 66

Presidio del Norte, Mex.	243. 51. 32.	51½. 6.	John H. Clark.

7. Scotophis Emoryi, B. & G.—Head rather narrow; vertical plate elongated. Eye large. Median six or eight scales only carinated; very slightly. Dorsal rows 29. Above ash-gray, with a dorsal series of transverse brown blotches, on each side of which are two others of smaller size; indistinct traces of a third. A frontal brown vitta passing back through the eye, and crossing the angle of the mouth on to the side of the neck.

Plates and shape of head much as in *S. guttatus.* Vertical plate more elongated than in the species of allied color, being decidedly longer than broad. Head rather narrow. Eye larger than in *S. guttatus,* its centre a little posterior to the junction of the 4th and 5th labials. Postorbitals resting on the 5th labial, as in the other species. Anteorbital large. Loral elongated, acute angled behind. Upper labials 8, 6th and 7th largest; lower 11, 6th largest. Dorsal rows of scales 29, central five or six only carinated, and those only slightly: exterior row largest, rest nearly equal. Ground-color grayish ash. A series of olivaceous brown transverse quadrate blotches along the back, 70 in number, the 50th opposite the anus. These are ten or twelve scales broad, two to three long, and separated by intervals of one to two scales. They are narrowly margined with black. On each side of the dorsal series, and alternating with it, is a series of smaller, nearly circular, but similarly constituted blotches extending between the 3d, and 7th or 8th rows: below this,

and on the 2d and 3d rows, is a still smaller and quite indistinct third series, and occasionally traces of a fourth on the 1st and 2d. The ground-color or space between the blotches is grayish ash; each scale minutely mottled with dark-brown or black; the extreme border generally pure ash, especially on the sides. Beneath yellowish white, with rather indistinct blotches of brownish ash, thickest behind.

Head grayish ash, with a somewhat curved broad brown vitta on the back part of the postfrontals, which, involving the commissure of the anteorbital and superciliary, passes back through the eye, and crossing the angle of the mouth on the adjacent halves of the ultimate and penultimate labials, extends into the blotches on the sides of the neck. A second nearly effaced bar crosses the anterior frontals, leaving an ash-colored band half the width of the first-mentioned bar. The anterior dorsal blotch is replaced by two elongated ones running up on the head to the centre of the occipitals, parallel with the postocular vitta, with an ash-colored stripe between the two, which extends from the superciliary backwards on the sides of the neck. As in the other brown marks, these stripes are margined by black. The adjacent edges of the 4th and 5th labials are brown. This is the only species except *S. guttatus*, in which the postocular vitta crosses the angle of the mouth, and passes down the side of the neck. There is scarcely any indication of elongation in the lateral spots except anteriorly.

This species differs from *S. vulpinus* in the gray color, much larger eye, longer head, narrower vertical, &c.; from *S. lætus* in much the same points as well as in having the dorsal spots transverse not longitudinal; from *S. Lindheimeri* in lighter color, and absence of white margins to the basal ends of the dorsal scales.

Howard Springs, Tex. 217+1. 72. 29. 41¼. 7. J. H. Clark.

8. Georgia obsoleta, B. & G.—Postorbitals resting on the fifth labials, not on the 4th, as in *Georgia Couperi*. Black above, beneath slate-color; anteriorly with the bases of the scutellæ red.

Syn. *Coluber obsoletus*, Say in *Long's* Exped. Rocky Mts., I, 1823, 140.—Harl. Journ. Acad. Nat. Sc. Philad. V, 1827, 347; and Med. & Phys. Res. 1835, 112.—Holbr. N. Amer. Herp. III, 1842, 61. Pl. xii.

Upper labials 8; 7th and 8th largest; postorbitals supported by the 5th; 6th labial small, triangular, but still separating the 5th and

7th, which do not meet above it. Lower labials 9; 4th and 5th largest. Two rows of temporal shields. Two lorals in one specimen, one in another. General color above deep black; some of the scales having dashes of reddish white at their bases, scarcely indicating blotches as in *Scotophis:* the same color is sometimes shown on the skin. Beneath slate-black. The color is uniform on the posterior half: the bases of the scutellæ then begin to exhibit more or less of pale reddish white, which tint increases in extent and intensity anteriorly until towards the head the slate-color is only seen along their edges, the tint there being a dark salmon-color. The posterior margins of the upper and lower labials, as well as all the plates on the sides of the neck and beneath, are edged with well-defined black. Sides of the head reddish brown, margined as above.

Eagle Pass, Tex.	193. 60. 17.	$45\frac{3}{4}$. $7\frac{3}{4}$.	Arthur Schott.
"	193. 56. 17.	$48\frac{1}{2}$. $9\frac{3}{4}$.	"

9. Ophibolus Sayi, B. & G.....Page 84

Variety with transverse penultimate bands.

Eagle Pass, Tex.	210. 59. 23.	$37\frac{6}{8}$. $5\frac{3}{8}$.	Arthur Schott.

10. Masticophis flavigularis, B. & G.....Page 99

Mr. Clark mentions having seen specimens of this species on the upper Rio Grande, with a decided tinge of red. It would not surprise us, therefore, to find it the same with *Coluber testaceus,* Say—a point of much interest, as this is the only one of Say's Western species which we have not identified as clearly distinct.

Presidio del Norte, Mex. 200+1. 167. 17. 56. $15\frac{1}{8}$. John H. Clark.

11. Masticophis ornatus, B. & G.....Page 102

A highly marked specimen, differing somewhat from those already described. Very dark purple on the back, lighter on the sides between the light lines. A narrow yellow line along the contiguous edges of the abdomen and outer dorsal rows. The 4th row of scales with the adjacent edges of the 3d and 5th, are yellowish white, with a well-defined black line through the centre of the former. Down the centre of all the rows as well as the fourth, is a black line, most intense on the 1st and 3d rows. At successive intervals along

the back, are seen broad transverse light bands, produced by the obliteration of the black line in the 4th row, and by all the dorsal scales between the light lines being yellowish white, with more or less of purplish black towards the tips. There are about eight of these dorsal marks on the anterior three-fifths of the body, the first being indicated by a light bar on the nape.

Howard Springs, Tex. 206+1. — 15. $61\frac{3}{8}$. $17\frac{5}{8}$. J. H. Clark.

12. Masticophis Schotti, B. & G.—Greenish brown, with two narrow white lines on each side, becoming obsolete at about three-fifths of the length from the head. Scales on the back yellow at the base. Sides of the neck in front red. Dorsal scales in 15 rows.

This species presents quite a close relationship to *M. taniatus,* although sufficiently different in its distribution of color. The general tint above is a dark greenish olive. On each side are two well-defined narrow yellowish white lines: the first along the junction of the outer dorsal row and the abdominal scutellæ, involving only the adjacent angles; the second similarly constituted in relation to the 3d and 4th rows (not running through the centres of the scales). The portion of the 3d and 4th rows not involved by the upper white line is black, as is also a narrow margin above the lower white line, of the same diameter with it. The upper angles of the scales in the first row, and the whole of those of the second row, are of a lighter olive than the back. All the scales on the back between the upper yellow lines of opposite sides are margined with yellow along their basal edges, only evident on separating the scales. Anteriorly is a short yellow line along the junction of the 2d and 3d rows of scales, extending to about the 25th abdominal scutella.

Color beneath dull yellow, with the greater part of the scutellæ closely and minutely blotched with greenish slate. Anteriorly the proportion of yellow is much greater, and near the head the blotching is in two series, as in the rest of the genus. The tail also is nearly unspotted yellowish, except anteriorly. On the external fourth of the abdominal scutellæ the blotching is more confluent, forming a well-defined margin to the lower yellow line. Anteriorly the side of the abdomen is of a dull red. The upper jaw is yellowish white, excepting the lower edges along the 1st to the 6th labials, which are black. Orbitals, loral, and nasals with a yellow central spot.

The lateral stripes become obsolete at about $\frac{3}{5}$ of the length from the head, so that the body posteriorly is nearly unicolor above. Upper labials 8, 7th longest; lower 9, 5th largest.

Eagle Pass, Tex. 201+1. 138. 15. 54½. 17¾. Arthur Schott.

13. Salvadora Grahamiæ, B. & G.....Page 104

This specimen has but two anteorbitals, the upper very large; in other respects it is as previously described. The under parts appear to have been of a delicate reddish salmon-color.

Presidio del Norte, Mex. 189+1. 100. 17. 28¾. 7¾. John H. Clark.

14. Leptophis majalis, B. & G.....Page 127

Eagle Pass, Tex. 162+1. 127. 17. 28. 16⅜. Arthur Schott.

15. Diadophis regalis, B. & G.....Page 115

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16. Rhinocheilus Lecontei, B. & G.....Page 120

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17. Tantilla gracilis, B. & G.....Page 132

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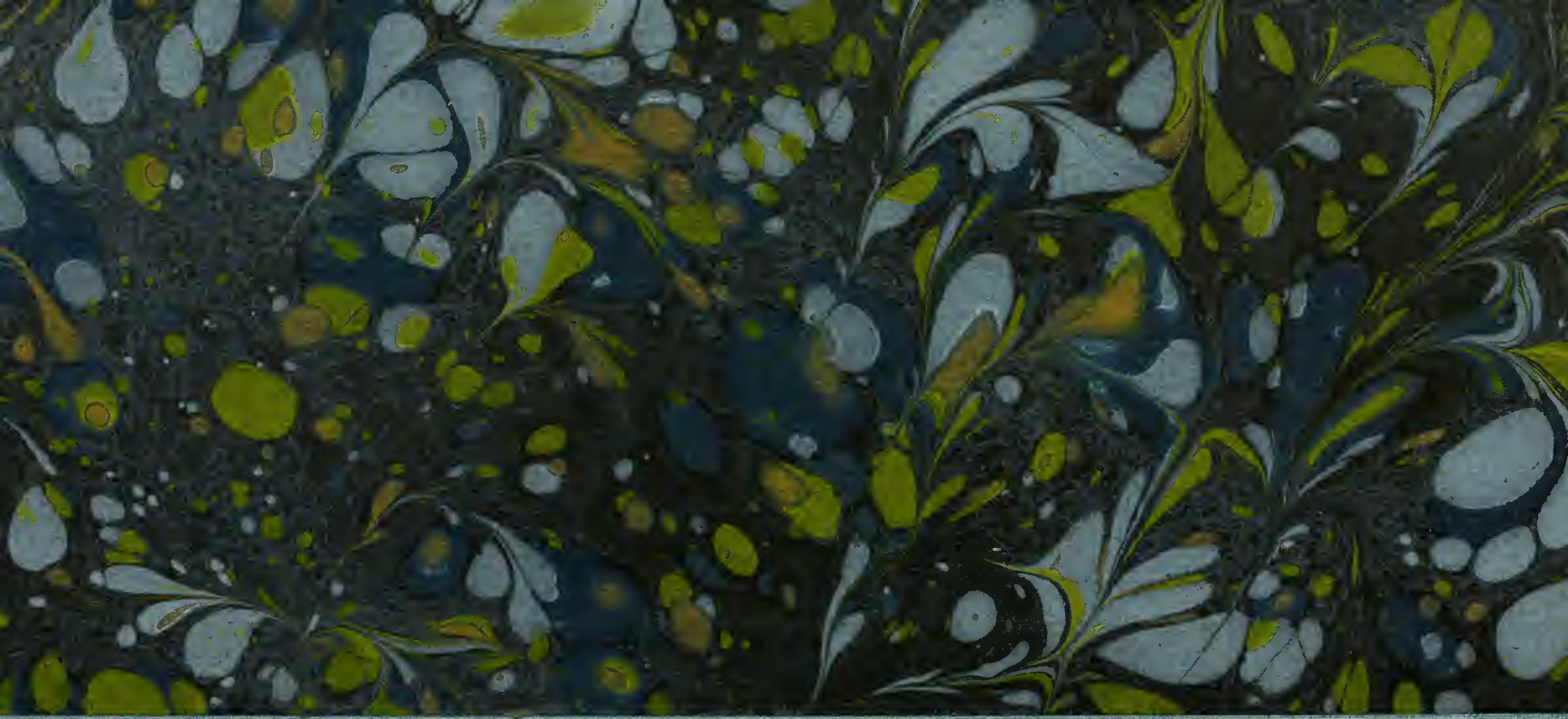
THE END.